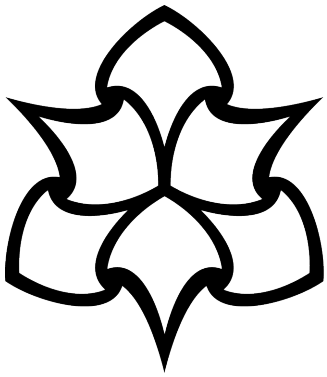


Geographic and socio-economic inequalities and access to higher education: Is the proximity of higher education institutions associated with the probability of university attendance for young people in England?

Peter Michael White

Dissertation submitted to the Department of Education, University of Oxford, in part-fulfillment of the requirements for the Degree of Master of Science in Education

August 2016

Abstract

The relationship between geography and university choice is well documented and suggests that a student's location substantially limits their selection of university. However, there are relatively few studies investigating the interplay between geography and university participation. These few studies reach varied and conflicting conclusions. The most recent study of geography and participation in England used a dataset over ten years old, and, since which, tuition fees have risen over ninefold (Gibbons & Vignoles, 2011). This study aims to establish if distance to university is associated with the probability of participating in higher education in England and if this relationship is evenly spread across regions. It also explores how distance may impact student's university decisions. The project uses a mixed methods research design that combines a quantitative analysis of secondary datasets with an analysis of interviews. The study employs a partially mixed sequential dominant status design with a regression analysis of HEFCE participation data forming the core of the study. Controlling for deprivation, the regression analysis uses average direct measures of distance between each ward and university campus in England to determine the relationship between distance and university participation. The findings suggest that geographical distance to university has a significant negative association with university participation indicated by an average 1% drop for every 6km the distance measure increases. A regional analysis suggested that the association was greatest in the East of England region and an interaction analysis indicated that students in deprived and distant wards suffered a double disadvantage. Interview responses from experts on Key Stage 5 student progression complemented the regression analysis and uncovered that participation in rural areas is subject to greater financial and social costs. It is hoped that the findings of the research may help to raise awareness of geographical inequalities and inform policy on university access.

Table of Contents

Figures and Tables

Figures

Tables

Chapter 1: Introduction

1.1 Access to Higher Education; the Underestimated Impact of Distance

> "Why am I the first Kinnock in a thousand generations to be able to get into university?... Was it because all our predecessors were thick? Did they lack talent? Those people who could sing and play and recite and write poetry?... Was it because they were weak? Those people who could work eight hours underground and then come up and play football… does anybody really think that they didn't get what we had because they didn't have the talent or the strength or the endurance or the commitment? Of course not. It was because there was no platform upon which they could stand."
> Neil Kinnock 1983 (Jones, 1994, p. 99)

There continues to be a substantial minority of students who are denied access to university generation after generation, not because they lack skill or strength but because they have no opportunity. The above quotation from Kinnock, the former leader of the opposition, is as relevant today as it was in 1983. Evidence and awareness of the socio-economic and ethnic inequalities in access to university is well documented (Anders, 2012; Boliver, 2013; Mangan, Hughes, Davies, & Slack, 2010). However, the potential barrier of distance is rarely discussed and poorly understood.

Kinnock was born and raised in Tredegar, in the Valleys of South Wales, a community built on coal mining and iron manufacturing (Leapman, 1987). Kinnock's speech identifies a metaphorical distance between classes when he describes a community that relies heavily on work underground. This highlights the disparity of opportunity between young people from different social classes. However, there is no reference to the physical distances between his community and higher education. Working class families in the Welsh Valleys in the mid-twentieth century would have had few opportunities to interact with graduates, and were unlikely to have ever set foot in a university (James, 2001). The nearest university to Tredegar was in Cardiff, which is over an hour away by public transport today. This distance creates a barrier for gaining information on opportunities, increases the price of relocation or commuting, and increases the emotional costs of leaving the community to study. Higher education for the people of Tredegar continues to be remote and inaccessible. Blaenau Gwent, the region that Tredegar is situated in, has the lowest university participation rate for full-time undergraduate courses in Wales (HEFCW,

2014). The constituency of Blaenau Gwent[1] had a university entry rate[2] of 19.3% in 2015, which places it in the lowest 6% of UK constituencies (UCAS, 2016a).

Attention is now turned from Wales to England. The two countries' education systems have much in common yet differences in higher education funding have emerged with devolution. These discrepancies, and the inconsistencies between the data available from the Higher Education Funding Council for Wales (HEFCW) and the Higher Education Funding Council for England (HEFCE), complicate comparisons, thus this study only focuses on the English education system. Occasionally, where statistics on England cannot be found, UK statistics are used.

1.2 The Importance of Access to Higher Education

Access to higher education is essential for facilitating social mobility and developing a workforce that is highly skilled and able to adapt. In the UK, calculations of the additional wages a graduate earns over a lifetime range between £160,000 and £400,000 (Chitty, 2014; Singleton, 2010). Fair access to the labour market is predicated on fair access to higher education, which is the foundation of a meritocratic society. Social cohesion is dependent on social justice, which may be measured by fair access (Department for Education, 2004). Fair access to higher education ensures that talent may access the skills to reach their potential and thrive in the fields to which they are predisposed.

Evidence that access to higher education is mediated by socio-economic status (SES) raises concerns of a cycle of the children of graduates gaining greater access to university and social mobility suffering substantially. A regression analysis of the longitudinal UK British cohort study revealed that students with graduate parents had a greater probability of attending elite universities (Sullivan, Parsons, Wiggins, Heath, & Green, 2014). This was attributed to the parents' ability to coach their children into university and also to the higher attainment they were likely to gain due to their SES. If graduates earn greater salaries, then they may also have the ability to select housing near better quality schools and nearer universities. After relocating for university they may choose to settle near their alma mater. This could engender a cycle of graduates choosing to live near universities, which may provide greater opportunities to access higher education for their offspring.

[1] Within which Blaenau Gwent is also situated

[2] The number of application acceptances divided by the population

1.3 Access to Higher Education in England

Between 1950 and the first Blair administration, the university participation rate increased from 3% to 33% (Chitty, 2014). In the 1980s concerns were raised that Britain had the lowest proportion of graduates of any European country except Spain and Portugal, and under half of the number of graduates of the United States (US) and Japan. Furthermore, Britain had the lowest proportion of working class students of any European country. The Thatcher Government called for a doubling of the proportion attending university in 1989 and the New Labour Government increased this target to 50% of the population in 2002 (Chitty, 2014).

The proportion of English 18 year olds entering university in 2015 stood at 31.3% (UCAS, 2015). Applications to University for the 2016 January deadline were raised by 1.2% to 36.6%, which was the highest rate ever recorded (UCAS, 2016b). The latest international figures suggest that UK higher education participation rates[3] remain below the levels in the US and Japan but above the average of OECD[4] and EU 27 countries (OECD, 2015a). Despite the increasing proportion of young people attending university, there remain concerns that socio-economic and ethnic biases continue to mediate attendance (Boliver, 2013; Mangan et al., 2010). There are suggestions that the expansion of higher education was not equally distributed and that students from higher SES have disproportionately benefitted (Anders, 2012). In spite of substantial investment in widening participation through universities and schools, the socio-economic structure of graduates has barely changed over the decades (Morrison, 2011). Students in the top fifth income bracket are almost three times more likely to attend university than students in the bottom fifth (Anders, 2012). This phenomenon is attributed to the gap in attainment that emerges between lower and higher SES from a young age, by some authors (Anders, 2012). Anders suggests that access to university is meritocratic but that students from higher SES families have a greater probability of gaining top grades. In contrast, several studies highlight aspects of university access that are not meritocratic. For example, Sullivan et al. highlight that privately educated students are 2.5 times more likely to attend an elite university than a student with the same A level grades from a comprehensive school (Sullivan et al., 2014). Boliver suggests that access discriminates against ethnicity. Black Caribbean/ African and Pakistani/ Bangladeshi applicants were less

[3] For those under 30 years old
[4] Organisation of Economic Co-operation and Development

than two thirds less likely to receive a Russell Group university offer than their white peers that gained the equivalent grades (Boliver, 2013).

1.4 Changes in Access to Higher Education in England

Tuition fees have increased dramatically in the UK over the last twenty years. Free, income assessed university education was replaced by tuition fees in England and Wales in 1999 (Chitty, 2014). The 2004 Higher Education Act allowed English universities to triple the fees to up to £3,000 per year. Payment was no longer made up-front and repayments would only be made when graduates earned over £15,000 a year. The fees were tripled again to £9,000 by the coalition Conservative and Liberal Democrat Government of 2010 and the fee cap has been confirmed to be rising with inflation to £9,250 (Morgan, 2016). There are suggestions that, as the financial burden of higher education is increasingly placed on the student, the decision to apply will be increasingly be mediated by income (Christie, 2005).

Serious concerns were raised about university access in response to increases in fees. There were fears the fee increases would be regressive and discourage participation from students from low SES backgrounds. Conclusions on the impact of the fee increases are mixed. The UCAS analysis of the application trends since the 2010 increase in fees found a 10% drop in English applications. UCAS suggested there had been a particularly steep drop in applications from students from wealthier backgrounds but that the proportion of students from low SES remained relatively constant (Chitty, 2014). Conversely, Dunnet et al. suggested that non-traditional students were most discouraged from applying due to the increase in fees (Dunnett, Moorhouse, Walsh, & Barry, 2012).

1.5 Geographical Distribution of Higher Education in England

English universities are relatively evenly distributed with population density but there remain notable exceptions (Gibney, 2013). Greater London has twice as many registered higher education institutions per head than Greater Manchester. The history of each city's economy and status has shaped disparities, which are discussed below.

For almost six hundred years the only higher education institutions (HEIs) in England were in Oxford and Cambridge (Singleton, 2010). A very small proportion of the

English populace could attend these institutions without leaving home and thus it became the norm to relocate for university in England (Christie, 2005). This norm continued throughout most of the 19th and 20th centuries as universities were founded in waves from civic (Victorian), redbrick (Edwardian) and plate glass (1960s). From the 1960s a dual system was established with more vocational courses being offered in the Polytechnic stream. Polytechnics were then granted full university status in 1992, which increased the choice and competition of higher education in many cities, as polytechnics were frequently located near "traditional" universities (Singleton, 2010). As the numbers of HEIs has increased the average distance between students homes and HEIs has decreased. London's position as an imperial capital assisted it in establishing itself with global HEIs. Universities such as the School of African and Oriental Studies (SOAS) and Imperial College have proved a boon to post-imperial London. Meanwhile industrial cities were built on commerce and manufacturing, neither of which had notable links with traditional academic subjects. Thus the demand for a university education was lower in industrial cities and fewer universities were established. Unlike Germany, Britain has not pursued a national programme to correct imbalances (Spiess & Wrohlich, 2010).

Gibbons and Vignoles display the mean distances between the nearest three universities, from each pupil's postcode, measured via the railway line in Figure 1 below. The mean distance figure drops below 20kms in conurbations with three or more universities such as, London, Manchester, Birmingham and Leeds. Coastal areas outside the South East have higher distances scores, particularly Devon, Cumbria, Norfolk and Lincolnshire.

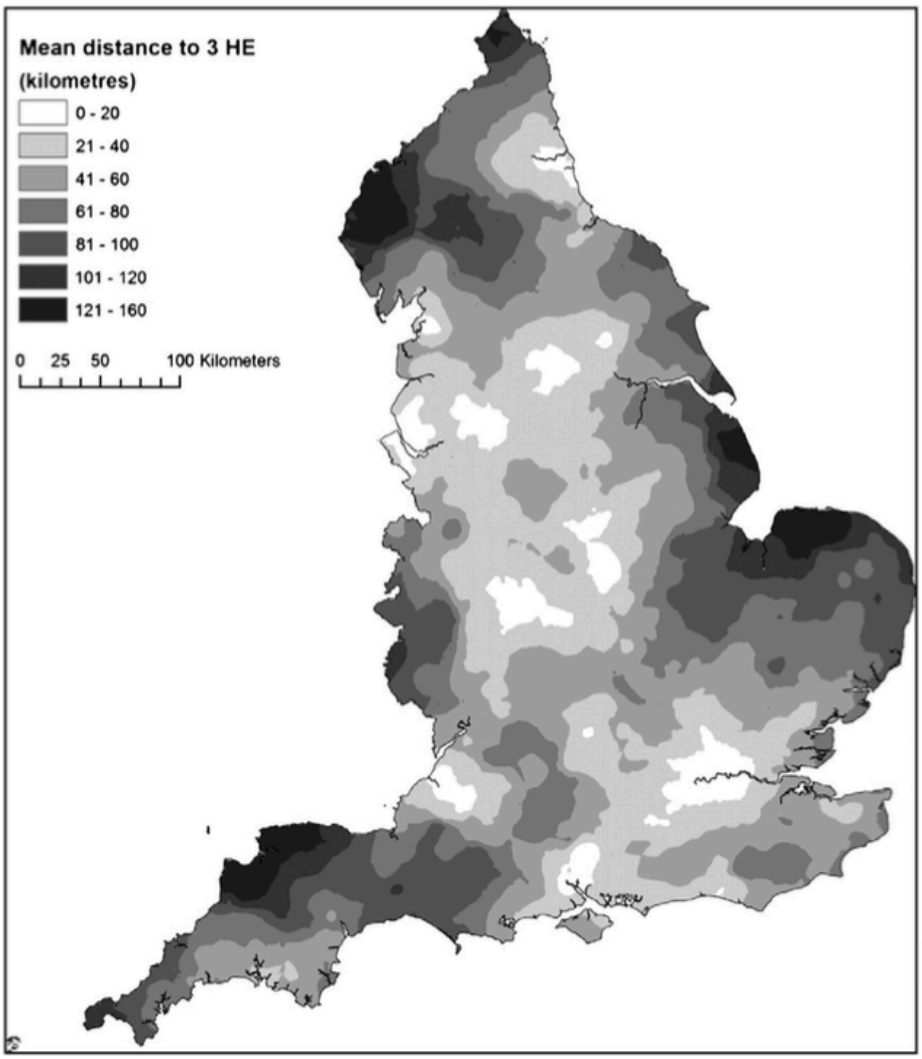


Figure 1: "Distance from home to nearest three universities in England. Figure shows interpolated mean rail-network distance distance to nearest three higher education institutions, based on postcodes of residence of age-16 pupils in 2002. Interpolation based on inverse distance weighting of nearest 100 neighbouring pupils, on 1 km grid". From (Gibbons & Vignoles, 2011)

Figure 2 below displays the multi-faculty universities across the English[5] regions. The map highlights the high density of institutions in London and how low the density is across the rural regions of the South West, East of England and the north half of the North West. When the distribution of universities is compared to population, the ratio of HEIs to population is highest in the North West and the northern portion of the West Midlands (Gibney, 2013).

[5] And one each in Scotland and Wales, the purposes of which are explained in Chapter 3

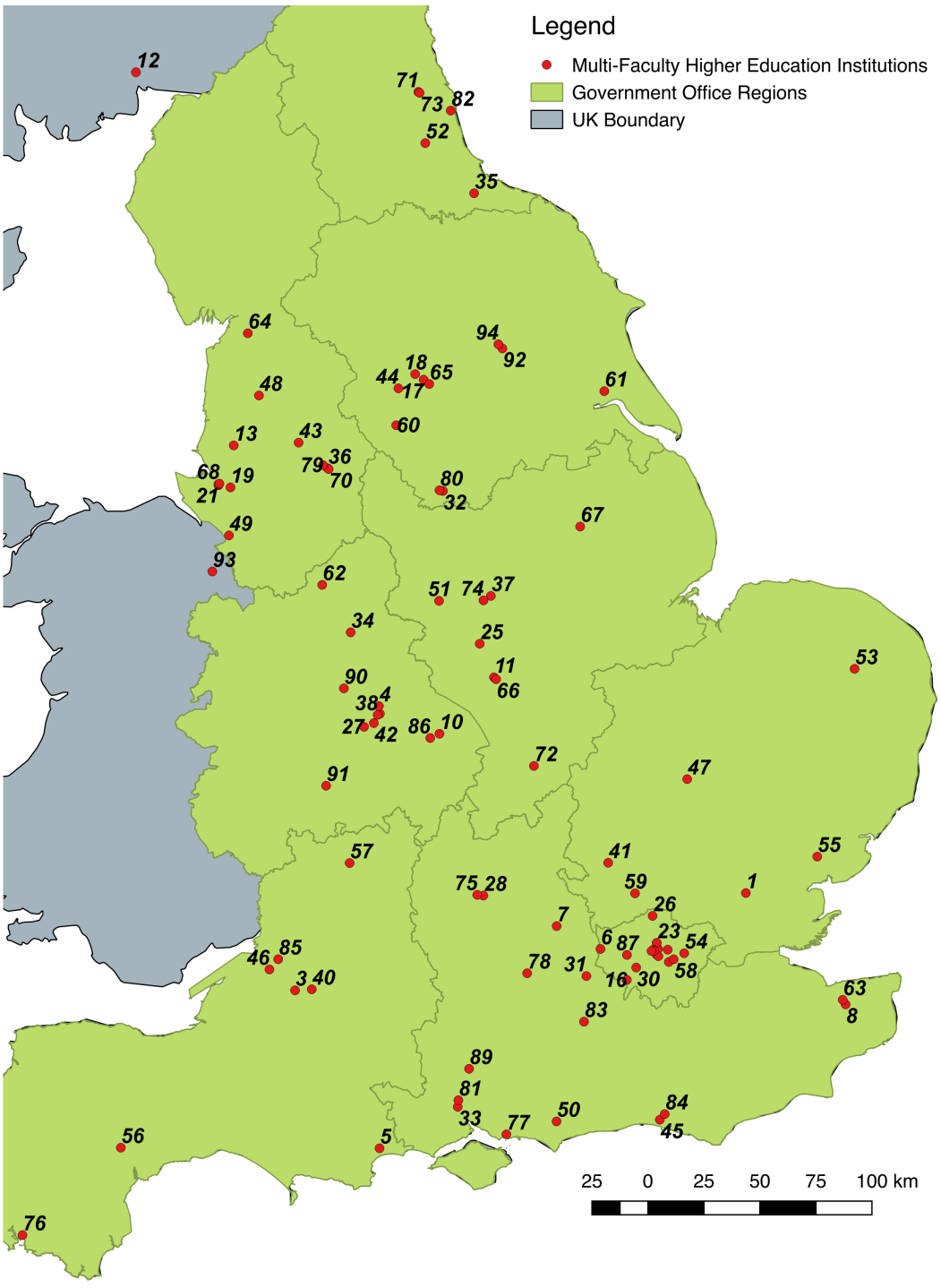


Figure 1 Map of Multi-Faculty Higher Education Institutions Included in the Analysis, (Please see Chapter 3: Methodology for further details)

Key

Number	University
1	Anglia Ruskin University
2	Aston University
3	Bath Spa University
4	Birmingham City University
5	Bournemouth University
6	Brunel University
7	Buckinghamshire New University
8	Canterbury Christ Church University
9	City University
10	Coventry University
11	De Montfort University
12	Dumfries Campus
13	Edge Hill University
14	Goldsmiths College, Uni. of London
15	King's College London
16	Kingston University
17	Leeds Metropolitan University
18	Leeds Trinity University
19	Liverpool Hope University
20	Liverpool Institute of Performing Arts
21	Liverpool John Moores University
22	London Metropolitan University
23	London Metropolitan University (North)
24	London South Bank University
25	Loughborough University
26	Middlesex University
27	Newman University College
28	Oxford Brookes University
29	Queen Mary and Westfield College
30	Roehampton University
31	Royal Holloway
32	Sheffield Hallam University
33	Southampton Solent University
34	Staffordshire University
35	Teesside University
36	Manchester Metropolitan University
37	Nottingham Trent University
38	University College Birmingham
39	University College London
40	University of Bath
41	University of Bedfordshire
42	University of Birmingham
43	University of Bolton
44	University of Bradford
45	University of Brighton
46	University of Bristol
47	University of Cambridge
48	University of Central Lancashire
49	University of Chester
50	University of Chichester
51	University of Derby
52	University of Durham
53	University of East Anglia
54	University of East London
55	University of Essex
56	University of Exeter
57	University of Gloucestershire
58	University of Greenwich
59	University of Hertfordshire
60	University of Huddersfield
61	University of Hull
62	University of Keele
63	University of Kent
64	University of Lancaster
65	University of Leeds
66	University of Leicester
67	University of Lincoln
68	University of Liverpool
69	University of London
70	University of Manchester
71	University of Newcastle Upon Tyne
72	University of Northampton
73	University of Northumbria
74	University of Nottingham
75	University of Oxford
76	University of Plymouth
77	University of Portsmouth
78	University of Reading
79	University of Salford
80	University of Sheffield
81	University of Southampton
82	University of Sunderland
83	University of Surrey
84	University of Sussex
85	University of the West of England, Bristol
86	University of Warwick
87	University of West London
88	University of Westminster
89	University of Winchester
90	University of Wolverhampton
91	University of Worcester
92	University of Wrexham
93	University of York
94	York St John University

1.6 Defining Concepts

Distance is a concept that may be interpreted in several ways. The distance between a student and a university could be measured in miles, minutes or on a Likert scale of a student's perception of distance. This study interprets distance to university as a geographical measurement between two fixed points. Conceptualising and calculating distance by duration of travel may offer greater ecological validity, as infrastructure or terrain may mediate the duration of travel between two locations. Unfortunately, this study is subjected to time and resource constraints that mean such complex calculations across England are unfeasible.

The probability of attending university is conceptualised as the proportion of young people attending HEIs shortly after gaining their Key Stage 5 qualifications. Mature students are not included in this definition but only make up a small minority of the total undergraduate population. Higher education participation is defined as the proportion of people under the age of 19, participating in higher education. Higher education is defined as any institution that is registered with the Higher Education Funding Council of England (HEFCE) as a higher education provider.

Chapter 2: Literature Review

2.1 Introduction

This research project investigates the relationship between distance and university attendance. There are many studies that evidence how proximity to HEIs impacts students' choice of university (Mangan et al., 2010). However, there is substantially less literature which investigates if distance influences the decision to attend university or not. For decades financial support offered by the UK government has been assessed on household income to support poorer students and encourage those that may not otherwise attend[6] (Weale, 2016). In Germany, funding is also provided for relocation and travel but in England the increased costs of distance are not recognised (Spiess & Wrohlich, 2010). Widening participation initiatives in England focus on unrepresented groups but the potential challenges or benefits of distance are not on the agenda (Chowdry, Crawford, Dearden, Goodman, & Vignoles, 2010). This study aims to investigate the interplay between distance and higher education participation, so that access to university may be understood in greater depth.

2.2 University Selection and Proximity to Institutions

There is extensive evidence in the substantive literature that proximity to university influences students' selection of course and institution. Evidence of such trends have been noted in quantitative and qualitative studies in Canada, Germany, the Netherland, Switzerland and the UK (Denzler & Wolter, 2010; Frenette, 2004; Gibbons & Vignoles, 2011; Mangan et al., 2010; Sá, Florax, & Rietveld, 2006; Singleton, 2010; Spiess & Wrohlich, 2010). Mangan et al. conducted surveys in two areas in England, with 1272 students aged 16-19 from ten institutions. Their results suggested that institutional choice was significantly influenced by proximity, demonstrating that students living nearer to "high ranking" universities had a 12% increase in the probability of applying to these institutions (Mangan et al., 2010). In a larger English study that employed the National Pupil Database, Gibbons and Vignoles conclude that "geographical distance has a strong influence on institutional choice" (Gibbons & Vignoles, 2011). Furthermore, in Canada and the Netherlands

[6] The financial support of student bursaries are now being phased out (Weale, 2016)

studies using national datasets demonstrated how distance mediates the probability of attending either vocational or academic HEIs (Frenette, 2004; Sá et al., 2006).

2.3 University Participation and Proximity to University

There are several studies that use substantial samples and rigorous quantitative methods that confirm a negative association between distance and university participation. Frenette interrogated Canadian national data with a regression analysis and concluded that students living beyond commuting distance[7] were 37% less likely to attend than those living within commuting distance (Frenette, 2004). Distance played a more substantial role in low-income students' likelihood of attending university. Therefore Frenette concluded that the mechanism behind the trend was primarily financial. Focusing on Australia, Parker et al. conduced a similar regression analysis on two large cohorts of students (N= 11999) (Parker, Jerrim, Anders, & Astell-Burt, 2015). Parker et al. measured the distance between the population-weighted centroids[8] of students postcodes and all but the most specialised and smallest university campuses. The paper concludes that increased distance is associated with decreased probabilities of university participation but emphasises the social and emotional costs of moving from intimate rural communities. Again students from low SES were more greatly impacted by distance.

Speiss and Wrohlich conducted a similar regression analysis on a national sample of German students who passed their Abitur, which qualifies students to apply to university (Spiess & Wrohlich, 2010). Speiss and Wrohlich created their distance variable by measuring the distance between the student's postcode and closest public university. The study concluded that "students living farther away are disadvantaged in accessing university" and attribute the trend to transactional costs (Spiess & Wrohlich, 2010, p. 476). However, Speiss and Wrohlich emphasise that disadvantages diminish beyond the median distance (12.5km). Unlike the Canadian and Australian studies, Speiss and Wrohlich do not observe distance to impact students from low SES more greatly. The paper suggests that this may be due to lower fees and more favourable loans for students in Germany (Spiess & Wrohlich, 2010, p. 476). However, the sample frame omits over half of German students who do not gain the Abitur, which is only available at the selective Gymnasium schools.

[7] Defined as 80km
[8] A single reference point of a given area based on the population data from the last census

Sampling students from only selective schools may bias the representativeness of SES and threaten the validity of conclusions on social class. Distance may also impact access to the Gymnasium school, a factor that is not addressed in the study.

2.4 University Participation and Proximity to University in England

There is scant research on the impact of distance and university participation in England. Gibbon and Vignoles provide the most rigorous and recent study on the subject, which claims to be the first of its kind (Gibbons & Vignoles, 2011). The study has the advantage of using a large dataset of all school leavers in England with individual pupil level data. Using the student attainment data, Gibbons and Vignoles control for nearest feasible institution, omitting universities that have entry tariffs above the students' age 16 attainment. Such precise data and sophisticated techniques establish a robust regression analysis. The study concludes, that although distance is strongly linked to institutional choice, there is "at most, a very weak link between home and-HE distance and the decision to participate" (Gibbons & Vignoles, 2011, p. 111). The report also suggests that students from low SES backgrounds and certain ethnic minorities are more greatly disadvanaged by distance in their institutional choices. British Pakistani and Bangladeshi girls seem to be particularly sensitive to distance, as do students from lower SES. It also states that distance "emerges as the most important general factor in institutional choice" and concludes that type and quality of HEI is largely governed by the type and quality of their local university.

2.5 Exploring Why Distance May Impact University Participation

The increased financial costs of living remotely are repeatedly cited in the substantive literature as impacting students' university decisions. Mangan et al. suggested that cost restricted the geographical locus of universities considered for application (Mangan et al., 2010). Frenette concludes that direct and indirect financial costs contribute not only to lower participation from remote regions but also to students from low SES suffering a greater disadvantage from distance (Frenette, 2004). Direct costs are identified as transactional costs such as van hire and purchasing furniture. Indirect costs are more abstract such as the loss of economies of scale from leaving the family home. Unlike Frenette's Canadian study, Spiess and Wrohlich's German study did not observe the same class differences (Spiess & Wrohlich, 2010). Spiess and Wrohlich concluded that the observed effects of

distance to university and university participation were primarily due to transactional costs such as “moving costs, rental costs, costs of purchasing new furniture or other items for a new apartment” (Spiess & Wrohlich, 2010, p. 471). If such an argument is plausible in an education system that compensates students for relocation costs and provides substantial grants, then it may be of greater significance in the English higher education system, where students bear substantially higher costs.

Parker et al. describe the Australian fee structure as “centrally regulated, consistent across universities and largely covered by government low interest loans with conditional repayments determined by wage” (Parker et al., 2015, 1157). These fiscal features are comparable to the finances of higher education in England. However, Parker et al. place greater emphasis of the social and emotional costs in their conclusion. The study suggests that students from distant districts are more closely connected to rural communities and therefore pay greater social costs if they move away. This increased social cost is prohibitive, which results in students forfeiting university to remain at home. English studies have suggested that students from lower SES have a stronger desire to remain at home, which has been attributed to a stronger regional identity and positive connection with their local area (Brooks, 2002). Greater familial ties were suggested as the explanation for the increased effect of distance on British Bangladeshi and Pakistani girls (Gibbons & Vignoles, 2011).

Brooks reviewed literature on the factors that influence young peoples’ decisions on higher education and concluded that choices were mediated by gender, ethnicity and SES (Brooks, 2002). Brooks’ study emphasised that although there is an underlying assumption that more informed students make “better” decisions on their future, the reality is more complex and nuanced. The way in which students’ interpret information on HEIs is shaped by their background. Similarly, there are indications that the impact of distance on higher education participation may be mediated by gender, ethnicity and SES. Female, low SES and ethnic minority students travel less distance to university, which indicates that distance travelled to university is mediated by gender, ethnicity and SES (Gibbons & Vignoles, 2011; Mangan et al., 2010).

Perceptions of university greatly influence decisions to apply and perceptions are determined by access to information, which is mediated by background (Brooks, 2002). Gibbons and Vignoles suggested that cost barriers may be “predominantly psychic” as they struggled to find evidence of increased housing or relocation costs (Gibbons & Vignoles, 2011, p. 111). Thus perceived costs of distance may be more important than measurable costs. Semi-structured interviews with students living at

home for study suggested that negative perceptions of debt were identified as the primary reason more ethnic minority students chose to remain at home for university (Christie, 2005). In a qualitative study conducted in North London, 16-18 year old students revealed that students perceived the best universities to be out of reach outside the capital (Hutchings & Archer, 2016). However, Figure 1 and 2 in the previous chapter suggests that Londoners have the greatest access to HEIs in England. This dissonance between perceptions and reality has the potential to jeopardise inferences made on participation trends.

2.6 Challenges of Understanding the Relationship between Distance and University Participation

Income, academic attainment and SES do not manifest a geographically even spread. Therefore an investigation into the relationship of university participation and distance is vulnerable to erroneous inferences if background characteristics are not controlled (Gibbons & Vignoles, 2011). Gibbons and Vignoles criticise selected studies for neither adequately controlling for interaction effects or demonstrating causality between distance and participation.

2.7 Criticism

The most substantial investigation into distance and university participation in England conducted by Gibbon and Vignoles also has flaws. The Australian, Canadian and German studies above all calculate distance as a direct line between the postcode of the students and their nearest universities. Gibbons and Vignoles calculate distance to university via the rail network. The authors justify this method stating it is “to avoid errors arising from infeasible shortcuts across river estuaries and the like”. The penetration of the UK rail network is low in areas most distant from universities. East Lindsey Local Authority, in Lincolnshire, is larger than Greater London but served by only four railway stations at its southern fringe (Office for National Statistics, 2006). The Richmondshire district of North Yorkshire has no railway stations in its borders yet it is only marginally smaller than Bedfordshire (Office for National Statistics, 2006). Distance measurements for students in these areas will be increased due to the marked distances between the pupil’s home address and the railway network.

Gibbons and Vignoles also estimate feasible universities that students may apply to based on a total point score of their GCSE attainment and university entrance

requirements. This measure is developed as a second model but has questionable measurement validity. Firstly, university entry requirements are conceptualised as one single measure, yet entry tariffs may vary strikingly between courses. For example the BA (Hons) Architecture course at Manchester Metropolitan University asks for 360 tariff points, equivalent to three As at A2, but in the same university the BA (Hons) Childhood and Family/ Sociology only requires students to gain 96 tariff points from A2 level qualifications or equivalent (Manchester Metropolitan University, 2015). Thus a single mean entry tariff would not reflect the reality of the spectrum accurately and undermines the validity of this second model. Additionally, students' attainment is only estimated from age 16 scores, which may misrepresent students' Key Stage 5 achievement. A geographical bias may emerge, for example if rural students were more likely to have to move institution for Key Stage 5 provision then they may be more likely to fall behind. Certain regions have higher proportions of sixth forms or colleges, these too may impact how accurately age 16 attainment reflects age 18 results.

Mangan et al. used large survey data to demonstrate how geography is associated with institutional choice in England (Mangan et al., 2010). In semi-structured interviews Hutchings and Archer uncovered how North London students did not want to move to attend university because they had a positive attachment to their local area (Hutchings & Archer, 2016). Gibbons and Vignoles interrogated a large national dataset, which suggested that an albeit, very weak link between a student's distance to HEI and the decision to participate (Gibbons & Vignoles, 2011, p. 111). However, there is no recent study that combines the benefits of clear trends from robust quantitative analysis with nuanced qualitative data from interviews. The regression analysis conducted by Gibbons and Vignoles was conducted on data that is over ten years old (Gibbons & Vignoles, 2011). Student's fees have increased over ninefold in England, since this data was collected, which may significantly impact the trends. An investigation into distance and participation is therefore overdue.

2.8 Research Questions

This research project addresses the following research questions:

1. Is distance to university associated with the probability of university participation in England?

2. Is the relationship between distance to university and probability of participating in higher education equal across English regions?

3. How does distance influence student decisions on university attendance?

2.8.1 Hypotheses

The following hypotheses were adopted for the first two research questions.

Research Question 1:
H_0: Distance to university is not associated with university participation, $\beta_0 = 0$
H_1: Distance to university is associated with university participation $\beta_0 \neq 0$

Research Question 2:
H_0: The relationship between distance and university participation is uniform across regions
H_1: The relationship between distance and university participation is not uniform across regions

2.9 Theoretical Underpinnings and Assumptions

There are underlying axiological assumptions that are implied in the research questions above. Firstly, that university attendance is perceived to be a valuable and desirable. The study also assumes that equal access is a valuable goal. A society that subscribes to egalitarian values must have fair access to public services. As higher education impacts salary, job security and influence in society it is especially important that access is fair (Department for Education, 2004). Further justifications of fair access are discussed above in section 1.2.

The distance between a student's home and higher education intuition addresses is a value which is reliable. However, the extent to which that measurement reflects the

students understanding of their proximity to university may be questioned. This study uses distance measurements and synthesises the results with interview responses, which rely on perceptions of distance. Perceptions of distance may not be as reliable. Unfortunately, this study does not have the scope for an extensive investigation on the measurement validity of perceptions of distance against geographical distance. Therefore the project works on the epistemological assumption that these two measures correspond consistently.

Chapter 3: Methodology

3.1 Introduction

This chapter establishes the methods selected to address the previously stated research questions. As this research draws on a mixed-methods approach, both quantitative and qualitative methods are discussed and explained below. This is followed by an examination of the epistemological assumptions. Finally, the ethical implications of the research methods and the steps taken to mitigate harm are examined.

A mixed methods design was employed in this thesis. The combination of quantitative and qualitative methods provides a broad, comprehensive analysis, which each method could not individually provide. The discourse that divides quantitative and qualitative analysis creates an unhelpful polarisation and oversimplification of methodology. Both quantitative and qualitative methods work towards the same goals by utilising observational data to answer research questions (Onwuegbuzie & Leech, 2005). In order to obtain a comprehensive understanding of the relationship of distance and university participation the three research questions are best answered using a mixed method design. A partially mixed sequential dominant status design is adopted (Leech & Onwuegbuzie, 2007). The study is sequential, as secondary quantitative data has been collected prior to the interviews. The quantitative method is dominant and is primarily employed to answer research questions one and two. The interview responses provide detail and nuance to tackle all questions but dominate explanations to the third research question.

3.2 Epistemological Position

A purely qualitative study is unable to confirm the broader trends and a purely quantitative investigation lacks the capacity to uncover the wider implications, which may be personal, nuanced and intricate. To understand geographical inequalities in higher education participation is to understand the differing personal circumstances that cause discrepancies in attendance. National participation data displays trends but qualitative data enables a more complex investigation of accounts why students choose whether to attend university. This study employs a regression analysis of national statistics, which is complemented with interview responses from experts on the university application process and student progression from most regions in

England. The national data provides a comprehensive overview of trends, which hundreds of interviews would be unable to deliver. Conversely, the interview responses provide a rich description of the perspective on the ground and an insight of the experiences of staff and students.

Each of these methodologies is built on its own philosophical traditions. Quantitative research methods, such as regression, randomized controlled trials (RCTs) and systematic reviews (SR), have proliferated in the field of education research over the last two decades (Hammersley, 2008). These methods are part of a post positivist philosophy, built on an ontologically objective reality. Post positivist research often disregards qualitative research such as interviews as being unrepresentative and unquantifiable. Interview research has historically developed through a different philosophical paradigm with an alternative, interpretivist epistemology. Only under the umbrella of mixed methods are these two traditions united. Mixed methods research has been associated with pragmatist philosophy because it attempts to answer research questions with the most suitable tools (Johnson & Onwuegbuzie, 2004). The pragmatist philosophical tradition recognises several epistemological approaches, thus the study is best understood through this lens.

3.3 Mixed Methods Design

This research project was conducted in three stages. Firstly, quantitative analysis of university participation and geographical distance in England was conducted by employing a multiple regression analysis. The association of university attendance and high SES is well documented. Multiple regression analysis is able to determine the relative impact of distance by controlling for SES with the Index of Multiple Deprivation (IMD) in the analysis. The second stage of the research process collected qualitative, semi structured interview data from experts in university applications, such as Heads of Sixth Forms, Careers Advisors and Key Stage 5 Teachers. Interviewees were asked to reflect on how local geographies of HEI distribution affected their students' participation choices and detail the progression of students from their school or college. The reasons for studying at the nearest HEI and details on university widening participation were also investigated. The final stage of the study synthesised the findings from the two studies.

3.4 Positionality

Subjectivity is accused of shaping the epistemological process and unduly influencing research (Chandler, Anstey, & Ross, 2015). Conducting and applying interview research may be particularly vulnerable to subjectivity. In the interests of transparency and to uphold validity I will briefly discuss my positionality. Firstly, this research form part of a masters degree, which has not received funding from external bodies. My experience of education may shape my understanding of access to higher education. I attended a school in the lowest performing decile for GCSE results but moved on to an above average sixth form college for Key Stage 5. The contrasting outcomes of students from each school broadly reflected Ander's finding that three times less students from the lowest income quintile attend university (Anders, 2012). This experience inspired my interest in educational research. I attended an "elite" university in London and worked for several years in a post-1992 university in the North of England. These two institutions served distinct regional communities and social classes. These experiences inspired an interest in geography's relationship with university participation. I am interested in removing barriers for disadvantaged students.

3.5 Quantitative Data Collection

3.5.1 National Statistics

This project uses primary and secondary data. Employing secondary data has practical and economical advantages. Secondary data's efficiencies are also associated with a cost. The accuracy and methodology of the data collection is entrusted in the organisation which collected the data. The secondary sources are the Higher Education Funding Council for England (HEFCE) and the Office for National Statistics (ONS). Both are recognised at providing accurate data.

3.5.2 University Participation Data

The HEFCE data on university participation is publically available online. The data downloaded for this study was collected from five cohorts of eighteen and nineteen year olds, who entered higher education between 2006 and 2011. The young participation rate is defined as the percentage of fifteen year olds, registered at state maintained schools, who attended university by age nineteen (Higher Education

Founding Council for England, 2012). The figures are provided in census ward units and aggregated over the five academic years. The sample contained data for 7966 census wards. No data was provided for eight census wards. These were all, with the exception of the Isles of Scilly, in the City of London. HEFCE state that this data was not supplied because the population numbers were too small and therefore potentially inaccurate. Please find the web addresses of all data sources below.

The young participation rate sample does not include students studying outside of state maintained schools, which represents approximately 6% of students in England. Furthermore, the young participation rate was determined as the proportion of students engaging in higher education, before age nineteen, from a total of students that were included on the National Pupil Database (NPD) and School Census, at age fifteen. Therefore students that moved from private schools to state maintained schools after Key Stage 4 are not represented. Additionally, students that chose to study outside of the UK or over the age of nineteen are not included. There are therefore gaps in this "national" dataset, which have the potential to distort the trend. However, this is a substantial sample of the complete figure from the state system, and large enough to make statistically significant conclusions.

HEFCE Gaps in Young Participation in Higher Education:
http://www.hefce.ac.uk/media/HEFCE,2014/Content/Analysis/Young,participation/Polar/Gaps in young participation data hefce website315.xlsx

3.5.3 Socio-economic Deprivation Data

The ONS website publically provides Index of Multiple Deprivation (IMD) scores for all Lower Layer Super Output areas. The 2010 index was selected because the data was predominantly collected in 2008, approximately the middle of the HEFCE data collection window. The index was created by combining the seven transformed domain scores using the weights displayed below (DCLG, 2011). Each domain score is calculated on several indictors. For example, the income domain is the combination of five indicators including income support, tax credits and jobseekers allowance.

- Income (22.5%)
- Employment (22.5%)
- Health and Disability (13.5%)

- Education, Skills and Training (13.5%)
- Barriers to Housing and Services (9.3%)
- Crime (9.3%)
- Living Environment (9.3%)

ONS English Indices of Deprivation:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6872/1871524.xls

3.5.4 Distance From University

A list of publically funded higher education institutions which have the power to award degrees, was obtained from the HEFCE website (HEFCE, 2016b). This produced a list of 136 institutions. Specialist, postgraduate or distance learning institutions were omitted from the list. The benefits of proximity to a specialised university are limited due to the narrow selection of courses available. Specialised universities were defined by a specific focus towards one discipline or faculty. Small universities with three or less faculties were also omitted due to their limited range of courses. Distance learning institutions, such as the Open University, pride themselves on their ability to transcend geography. The address of their central office does not represent the proximity of their operations as a standard university address might. Once these institutions are discounted, there remained 92 multi-faculty institutions. The full list of multi-faculty intuitions is attached to Figure 2 in the previous chapter. A list of omitted specialist and minor universities may be found in Appendix A below. This criteria approximately matched similar studies on the topic of geography and participation[9] (Gibbons & Vignoles, 2011).

The measurement between university and ward is vulnerable to inaccuracies due to the varying shapes and sizes of campuses. In this study, universities are conceptualised as one site with one address, which does not reflect reality. The marketisation of higher education has witnessed expansion, mergers and promotional campuses in the capital, as universities emulate the world of business. For example, the University of Coventry is in the process of establishing a new

[9] There are three discrepancies between the list of English HEIs in this study and Gibbons and Vignoles'. The London School of Economics and Political Science and Imperial College London have been excluded because they are research-intensive specialist universities. York St John University has been included because it hosts four faculties.

campus in Scarborough (Jump, 2015) and the University of Loughborough has launched a London campus (Else, 2014). Some universities occupy just one building, others may occupy a campus scattered across a city or region. It is beyond the scope of this study to assess the geographical centre of each university in England. Nonetheless, universities such as Coventry and Loughborough remain the exception to the rule and even in these cases the large majority of students are catered for at the universities main campus. Minor geographical tweaks to establish the true centre of a campus would have a low probability of yielding alternative results as English universities tend to be clustered within a relatively small geographical areas.

HEFCE Registered Higher Education Providers:
http://www.hefce.ac.uk/reg/register/search/Home/ByProperty

Scottish and Welsh universities are also potential university destinations for English students. Yet the Scottish and Welsh borders have been highlighted as "higher education cold spots" (Jump, 2015). There are two exceptions to this. Wrexham Glyndwr University may be one of the nearest HEI for students living in West Shropshire or South West Cheshire and the Crichton Campus of the University of Glasgow and University of West Scotland may be one of the nearest HEIs for English students in Cumbria and Northumberland. These universities have therefore been added to the list of HEIs used in the analysis, which makes a total of 94 institutions.

3.6 Matching and Analysis of Quantitative Data

The university participation data was labelled with ONS 2001 census ward codes. A lookup function identified the equivalent 2001 Lower Layer Super Output Areas (LSOAs), which could then be matched to IMD data. The ONS LSOA are clustered in groups of four to six within one Middle Layer Output areas. Please see Figure 4 below for a diagrammatic explanation. The participant data provided percentage values labelled with census ward codes, which represented 7961 Census Wards. The IMD statistics are more detailed with figures for all 32482 LSOAs. IMD statistics were therefore aggregated at the Middle Layer Output area, which synced with the Census Wards[10]. The corresponding government regions of each ward were also added to the dataset by using a lookup table. These regions were dummy coded in order that regional trends could be assessed in the regression analysis. To assist

[10] Radford and Park, Nottinghamshire was omitted at this stage as the IMD data was missing.

interpretation IMD and mean distance variables were subject to the rank, normal score transformation on SPSS using Blom's formula.

One of the strengths of this study is how neatly geographic data on deprivation dovetails with census ward data on participation. However, the years that the data was collected does not sync perfectly. The participation figures are aggregated annual figures from the 2006/07 to the 2010/2011 school years. The IMD data is the combination of data, predominantly taken from 2008 (DCLG, 2011). The effects of the 2007/8 financial crisis significantly impacted communities during the time the data was collected. In particular, the indicators of income and employment taken in 2008 for the IMD may not reflect an accurate gage of deprivation for 2011, when the final participation statistics were collected. Some regions and cities were more affected by the recession than others, and deprivation related data is likely to be volatile over this period. However, the aggregated participation data is collected before and after the recession. Thankfully, the depth of the recession falls within the middle of the data collection period, allowing the years of economic decline to cancelled out by years of economic growth before.

A lookup for population-weighted centroids obtained the easting and northing geographical coordinates for all census wards in the country. University postcodes were used to identify easting and northing figures from a geographic website (Grid Reference Finder, 2016). The easting and northing values of all census wards and university addresses were input into a Microsoft Excel worksheet. The distance between every census ward and university was calculated using Pythagoras' theorem, i.e. the corresponding easting and northings were subtracted and squared. The square root of the sum of both figures provided the direct hypotenuse distance in decimeters. These figures were multiplied by one thousand to transform the distance figures into kilometres. Excel's "INDEX MATCH" function identified the three shortest distances from all calculations between the ward and all universities in the sample. These three figures were aggregated to provide the mean distance to the nearest three HEIs. To improve accuracy, the mean figure was used in favour of the distance to nearest university, as not all students benefit from close proximity to all universities[11]. The nearest university variable was retained in order to apply a test of robustness.

[11] For example a student living near a high tariff university, with limited widening participation programmes, may not benefit from proximity especially if they were attending a deprived school or from a deprived neighbourhood.

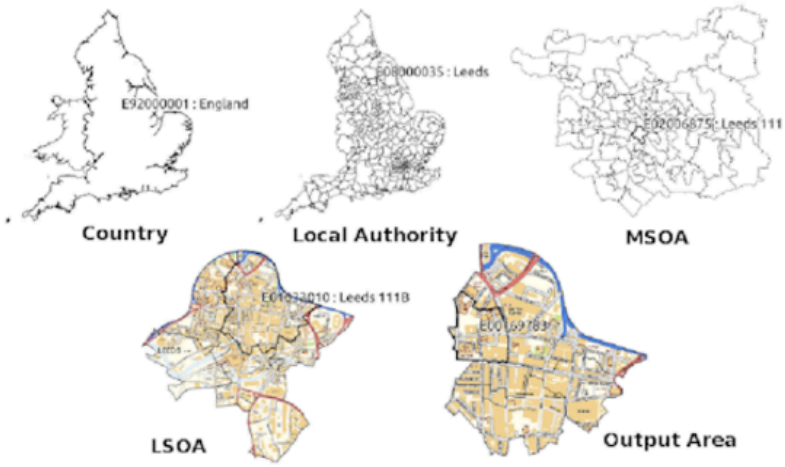


Figure 3: ONS Boundary Data

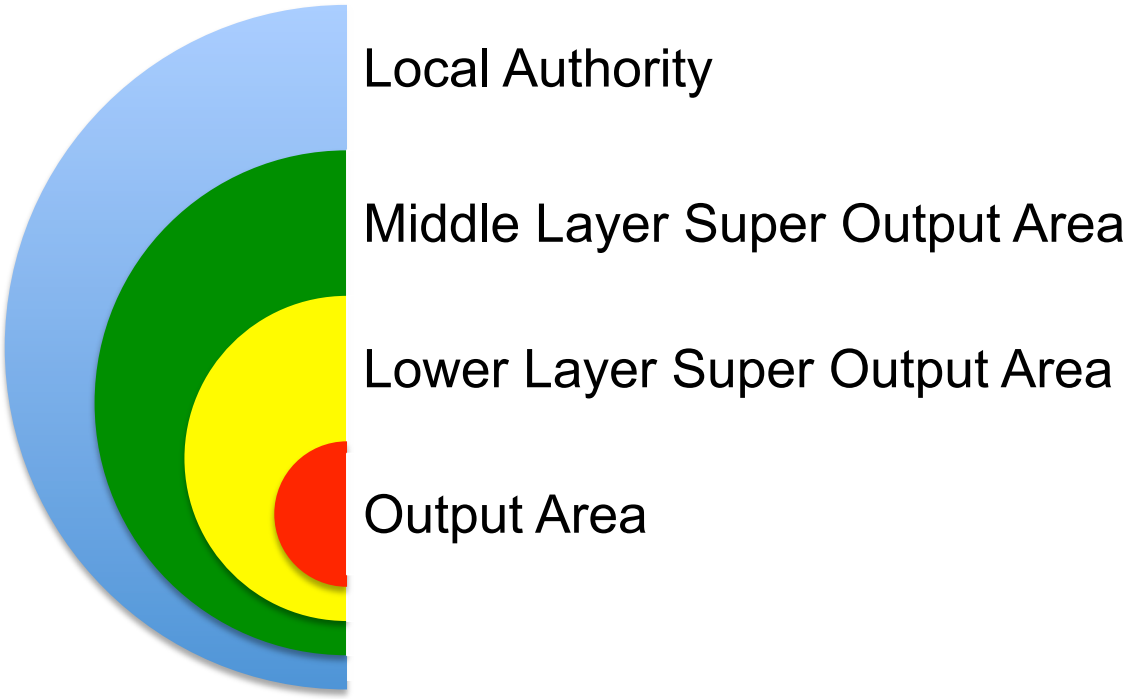


Figure 4: ONS Boundary Data Conceptual Diagram

A multiple regression analysis was employed, using IBM SPSS Statistics (V23.0), to assess the relative influence of distance. The IMD data was used as a control for deprivation and formed block one of the model. As stated in the previous chapter, SES does not manifest a geographically even spread. Controlling for IMD ensured that geographic differences in SES were not mistaken for geographic differences in participation. The distance calculations formed block two. Further analysis of regional variations were investigated when the dummy coded regional variables were included as a third block.

A test of robustness modified block 2 and replaced the mean distance to nearest three HEIs variable with the nearest HEI variable. Regional analysis was investigated further by isolating the data of each region. The same block one and two with IMD and mean distance variables were applied to the regression.

The dataset was segmented by region and the block one and two regression was repeated on each region. Segmenting datasets may lead to skewed results if divisions are biased. The English regions are predetermined, which restricts a biased division. They are also relatively self-contained as the universities across the land borders of Wales and Scotland have already been included in the analysis. Finally, an interaction analysis was conducted by multiplying the mean distance variable with the IMD variable.

ONS Lookups (Which provided details of Output area codes and English regions)
https://geoportal.statistics.gov.uk/geoportal/catalog/content/filelist.page?&pos=4&cat=#LU
ONS 2011 LSOA Population Weighted centroids
http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/external-links/social-media/g-m/2011-lsoa-population-weighted-centroids.html

3.7 Qualitative Data Collection

Experts in the Key Stage 5 progression were sought to provide an overview of student's experiences of challenges in accessing university in relation to their proximity to university. A student may be able to provide personal insight but a Head of Sixth form is able to summarise the progression of a cohort and in some cases several decades of cohorts. Experts on university applications may also provide not one but several individual stories and have a greater appreciation for structural factors, which young people have been reported to downplay (Brooks, 2003). Thus, for this study eight people across England were interviewed between the 3rd of May and the 17th of June 2016, to obtain an insight into student's consideration for university.

A sample with an even spread of measures of distance, deprivation and participation, in the wards in which the interviewees were employed, was perused to provide a range of perspectives. A regionalised and purposive method of sampling was employed due to anticipated poor response rates from contacting schools at random. Former colleagues, teacher trainees and contacts in education were approached to provide an introduction to potential interviewees. Purposive sampling is flawed in having a low probability of providing a representative sample (Robson, 2005). However, it was accepted that a small sample of eight interviews could never claim to provide an accurate reflection of all English students. The qualitative data is employed to provide a precise depiction of the trends. The interviews seek to embellish these trends with an insight into the nuanced detail of how students' lives are affected. Interviewees were also provided a standardised text at first point of contact, the full text of which is found in Appendix B.

After conducting the first four interviews, an assessment of the distance, deprivation and participation measured revealed that the samples were reflecting predominantly highly deprived neighbourhoods near universities. In order to gain a wider range of perspectives staff in remote and less deprived districts were contacted. The final two interviews were conducted over the phone. The South West and East of England regions were identified as hosting the greatest populations of students living a substantial distance form a university, as they are the most rural English regions. These regions were relatively inaccessible; therefore phone interviews were conducted, which saved time and money. It is accepted that a degree of rapport may have been sacrificed due to conducting the interviews over the phone.

Table 1: Table of Interviewee Backgrounds

Interviewee and Pseudonyms	**Place of Work**	**Role**	**Background**
Interviewee 1, Ms Middlesex, Lonton Sixth Form	Academy with sixth form in London	Higher Education and Careers Manager	The first interviewee had previously worked for an educational charity in the North of England and qualified as teacher in the North West of England. The main function of the Higher Education and Careers Manager in the school is to oversee the university applications process.
Interviewee 2, Mr Palatine, Westnorton College	Catholic comprehensive college in the North West	Careers Advisor	Mr Palatine has been supporting students in Westnorton college for five years and was promoted to college Careers Advisor last year. In addition to providing careers advice he facilitates higher education application support and events.
Interviewee 3, Mr Collegiate, North West University	Large post-1992 university in the North West	Widening Participation Manager	Mr Collegiate was promoted to Widening Participation Manager five years ago after ten years experience in the WP Office. This experience has provided him with a good understanding of where the student intake comes from and what barriers students' face in applying.
Interviewee 4, Ms Whiterose, Yorton College	Branch of city college in Yorkshire and Humberside	Personal Tutor	Ms Whiterose has been working at Yorton College for three years in three departments. Her role is primarily pastoral but she also assists with the university applications process and in particular the personal statements.

Table 1 Continued

Interviewee and Pseudonyms	**Place of Work**	**Role**	**Vignette**
Interviewee 5, Ms Mercia, Wesmiton Sixth Form	Comprehensive school with sixth form in the West Midlands region	Head of Sixth Form	The Head of Sixth Form at Westmiton School oversees all aspects of university application from organising campus visits, assisting students with searching for courses and writing personal statements.
Interviewee 6, Mr Sherwood, Mideaston Sixth Form	Comprehensive school with sixth form in the East Midlands	Head of Sixth Form	Mr Sherwood joined Mideaston Sixth Form four years ago. Managing the university application process or assisting students with alternative options is one of his primary roles as Head of Sixth Form.
Interviewee 7, Ms Wessex, Westsutton Sixth Form	Comprehensive school with sixth form in the South West	Teacher & Pastoral Tutor	Ms Wessex arrived at Westsutton Sixth Form earlier in the academic year but has experience of supporting students with applications and coaching gifted and talented students into Oxbridge. Before working at Westsutton Sixth Form, Ms Wessex had experience of working at two South West schools.
Interviewee 8, Ms Anglia, Aston Sixth Form	Comprehensive academy school with sixth form in the East of England region	Teacher & Pastoral Tutor	Ms Anglia has been working in schools in the East of England for several decades. Supporting Sixth Formers with university applications and other options has proved her with significant insight of the long term trends in the region.

3.8 Analysis of Qualitative Data

A mixed methods design was selected in order to gain an understanding of the robust national trends and capture the complexities of how distance impacts participation. Interviewing experts on Key Stage 5 education also enables a deeper understanding of the perceptions of distance on students, which is important as literature suggests that students interpret their data differently depending on their background (Brooks, 2002).

Semi-structured interviews were recorded with Audio Notetaker software and then transcribed verbatim. Semi-structured interviews were selected because they allow participants to elaborate on points they discern are relevant but also maintain a degree of consistency. Interviews were between thirty and forty minutes in length and followed a script that can be found in Appendix C & D. An initial pilot interview indicated overlap between two questions, regarding the relative barriers to higher education. The two questions were merged for the final draft below and an additional question on engagement with university widening participation programmes was added. Questions were adapted for the interview with the Head of Widening Participation, as this gained information from an alternative perspective. With the exception of these minor changes, all interviewees were asked the same questions in the same order. Interviews were conducted with consistency but prompts and probes were occasionally used to ensure the interviews remained on task.

The constant comparative method, of coding, matching themes and summarising content, was employed to analyse the data (Thomas, 2013). Coding was conducted manually on printed copies of the transcripts. The coding system evolved as themes were uncovered. An initial six codes were created on reflection of the substantive literature and a further eight emerged through the analysis process. Once the prevalent themes were identified the coding system enabled the location of key quotations, which were copied and pasted into a thematic table to assist with the discussion. In line with the method, these discrete facts were combined to form abstract patterns which could be connected to wider theories (Miles, Huberman, & Saldana, 2014).

3.9 Ethics

A benefit of conducting research with secondary data is the relatively limited ethical challenges. The HEFCE and ONS data used is anonymised and aggregated, which addresses a primary ethical challenge. The research topic of the study is not

considered contentious, which also reduces ethical risks and complications. However, collecting interview data is associated with ethical challenges, which need to be mitigated. Confidentiality and consent were identified as the most significant ethical issues of the project. These were addressed in the ethical approval and planning stages, confirmation of which can be found in the appendices below. The British Educational Research Association (BERA) guidelines were consulted during the planning and execution of the interviews to ensure that ethical codes were not breached (BERA, 2011).

The interview questions were developed to facilitate a good rapport and direct questions were avoided in the first half of interview schedule to put the participant at ease. Ensuring participants are comfortable assisted ethics and accuracy as more comfortable interviewees have been revealed to provide more accurate answers (Cohen, Manion, & Morrison, 2013).

Names and all institutions or locations were replaced with pseudonyms to protect the identity of the interviewees. After interviews had taken place the recordings were stored securely offline. Transcripts were written up and anonymised as swiftly as possible. Recordings were then deleted.

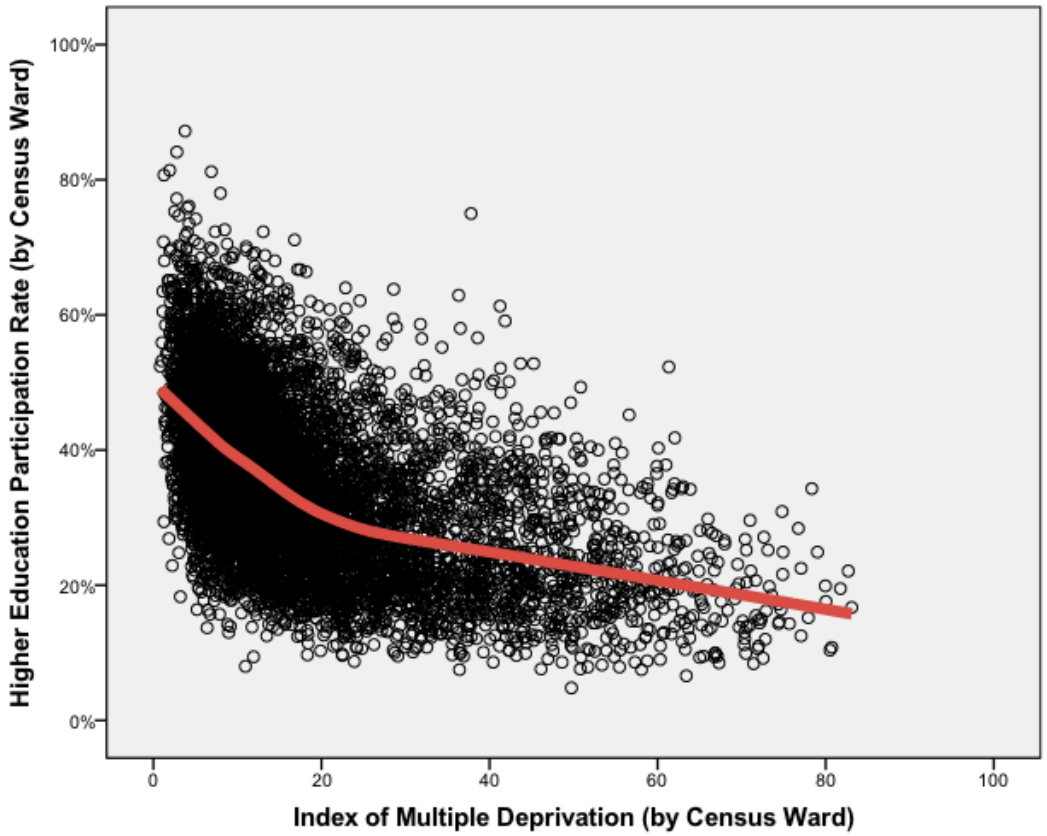
All interviewees were provided with a Participation Information Sheet, which explained the purpose of the research, stressed that contributions were with voluntary informed consent and explained that participants had the right to withdraw or not answer questions at any point. Consent forms confirming that participants understood these issues and provided consent were signed prior to all interviews. The full text of the Participation Information Sheet is found in Appendix E below. Interviewees were provided with an additional verbal summary of the participation information sheet before each interview and asked for verbal consent before proceeding with the interview.

Chapter 4: Findings

4.1.1 Quantitative Findings

4.1.2 Descriptives

This chapter displays the descriptive statistics, before presenting the regression analysis and regional trends. Figure 5 below supports the proposition that university participation in England is associated with SES, which is well documented in the literature (Anders, 2012; Gibbons & Vignoles, 2011; Sullivan et al., 2014). Census wards with high deprivation, indicated by a high IMD score, had lower university participation rates (r=-0.51). The lesser number of outliers below the distribution in Figure 5 suggests a limit to low participation. The dense cluster of cases on the left below the trend line is indicative of a large number of wards with relatively low deprivation experiencing low participation rates. This is in stark contrast to the top right of the graph, which suggests that wards with high deprivation have a very low probability in gaining a high university participation rate.



Pearson's R= -.51

Figure 5 Census Ward Participation Rates contrasted with IMD Scores

Table 2 below displays the mean higher education participation rate, IMD scores and mean distance between census wards and nearest three HEIs for each region of England. Aggregated participation rates manifest a relatively small variation with seven out of the nine regions displaying figures within two percentage points from the mean. London is an outlier on participation and variance, indicating that participation is persistently higher across the capital. Regional IMD scores have a greater variance. The region with the highest indication of deprivation (the North East, Mean= 25.64), displays a score almost double the region with the least deprivation (the South East, Mean= 13.68). Regions in the North[12] and London had the highest levels of deprivation with IMD scores well over 20. The mean distance to nearest three HEI figures revealed the greatest variance. Six out of the nine regions measured an average distance between 20 and 30 kilometers. London measured by far the shortest mean distance at 7.5km and the lowest variance. The East of England and the South West measured the farthest mean distances at 39.4km and 55.4km respectively.

Table 2 Participation, IMD and Distance Descriptives

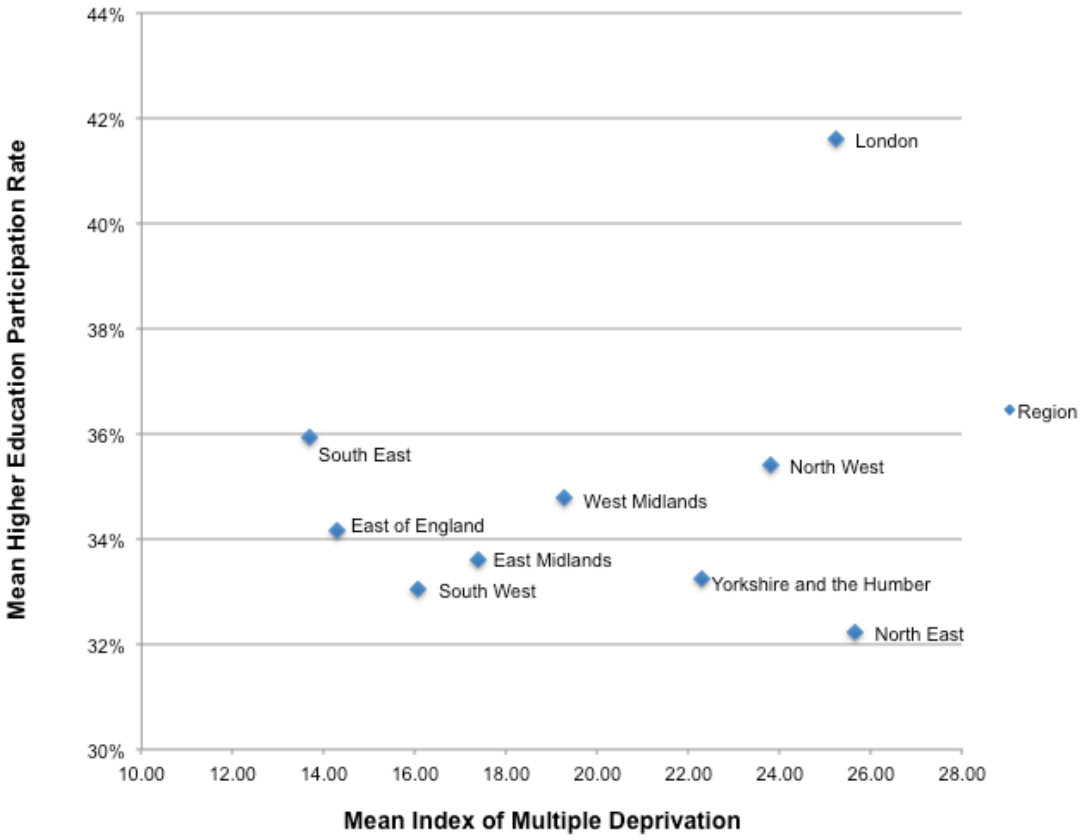
Region	Mean Participation Rate %	SD	Mean IMD	SD	Mean Distance (km)	SD
London	41.60%	10.49	25.22	13.42	7.55	3.72
South East	35.94%	12.64	13.68	10.43	25.64	10.21
North West	35.40%	13.28	23.78	18.39	27.74	24.53
East of England	34.18%	11.79	14.27	9.49	39.42	18.28
West Midlands	34.80%	11.46	19.26	14.10	23.87	12.60
East Midlands	33.61%	12.25	17.40	11.83	27.52	17.50
Yorkshire and The Humber	33.24%	12.77	22.29	16.45	27.67	13.93
South West	33.06%	10.64	16.08	9.36	55.36	38.11
North East	32.22%	13.65	25.64	16.96	24.16	15.89
Grand Mean	**34.92%**	**12.31**	**18.43**	**13.75**	**30.79**	**23.90**

Notes: IMD= Index of Multiple Deprivation

[12] The North East, The North West and Yorkshire and the Humber

Regional differences in participation do not manifest the same linear relationship with regional aggregate IMD. London has almost ten percentage points more students attending university than the North East yet the IMD score for each region is relatively similar. Figure 6 below displays the average participation rate and IMD score by region. In contrast to Figure 6, the strong negative correlation (R= -.51) has been replaced by a very weak positive correlation (R= .25). The outlier of London and aggregated data determine this spurious trend, however, the negative correlation is no longer observed. The relative levels of deprivation do not impact regions as Figure 6 may suggest. For example London and North West are in the top three most deprived regions but are ranked as first and third for participation rate. The East of England and South West are two of the three least deprived regions but both fail to gain a ranking in the top third for university participation. The East of England and the South West do not gain as high university participation rates as expected for regions with relatively low deprivation. This trend may assist in explaining the relatively high density of cases in Figure 5 that have low deprivation and low participation. The East of England and the South West regions are also the two outliers with the greatest average distances between each census ward and the nearest three HEIs. Similarly, London is an outlier in Figure 6, by enjoying a significantly higher participation rate than regions with similar levels of deprivation. London is also an outlier of the mean distance to nearest three HEIs measure, with a mean distance of 7.5km, 23km below the mean.

However, regional aggregated figures do not detail the complexities of inequality or allow a calculation of the impact of proximity to HEIs. In order to determine and isolate any association with distance a regression analysis is employed.



Pearson's R= .25

Figure 6: Mean Participation and IMD Score by Region

4.2 Regression Analysis

Multiple regression was used to examine the specific influence of proximity to HEIs. All analysis was completed using IBM SPSS Statistics (V23.0). Deprivation is controlled for by entering the ONS IMD score prior to entering the mean distance to nearest three HEIs. As explained in the Methodology, the IMD is a composite index of various socio-economic measures including income, employment, health and education. This is advantageous as it enables the elimination of various factors. The known predictor of deprivation was loaded onto block one using the IMD statistics. Mean distance to nearest three HEI was loaded onto block two. Please note that this is a correlational rather than an experimental study, suggested "effects" are solely statistical rather than causal.

4.2.1 Assumptions

Normality was observed in P-P Plot in Figure 8 below, which is indicated by a relatively straight diagonal line. The Figure 9 Scatterplot also suggested a normality of data due to the rectangular distribution of cases. These graphs and all other graphs and tables cited in this paragraph may be found in the appendices below. Collinearity diagnostics (Appendix H) indicate that multicollinearity was observed between IMD and IMD squared only, as anticipated. All other tolerance and variance inflation factor (VIF) statistics are within the thresholds of above 0.10 and below 10 respectively (Pallant, 2007). Casewise diagnostics (Appendix I) indicated that 35 cases had a standardized residual above or below 3/-3. In a normally distributed population we would expect to find 1% of the cases falling outside (Pallant, 2007). The 32 observed in this dataset represent 0.4% of the sample. The maximum Cook's distance statistic displayed in Appendix J is .004, which is below the threshold of 1, above which residuals may unduly influence on the model (Tabachnick & Fidell, 2013).

4.2.2 Effects of Deprivation

As displayed in Table 3 below, deprivation explained 30.4% of variation in participation rates ($F_{[1, 7958]} = 3473.8$; $p < .001$). This is a very high R squared change figure for the field of Educational Research. These figures suggest that the deprivation of a student's neighbourhood has a very powerful association with the proportion of students that attend university. On average a 1% increase in IMD was associated with a 0.55% decrease in university participation. There is a 0.55 SD difference in university attendance between students who are one SD above the mean level of deprivation and one SD below. This translates to a 15% participation gap. All regression figures below are statistically significant, which may in part be due to the large sample.

4.2.3 Effects of Average Distance to Nearest Three HEI

The final "Mean Distance to HEIs" block explains a further 2.9% variance ($\Delta F_{[1, 7957]} = 351.8$; $p < .001$). This increases explained variance to 33.3% ($F_{[3, 7957]} = 1989.4$; $p < .001$). The beta-weights below suggest that on average a 1km increase in mean distance from nearest 3 HEIs is associated with 0.17% decrease in university

participation. This is approximately equivalent to 1% decrease in HE participation for every 6 km the mean distance measure increases. The SD of the distance variable was 24km, therefore the difference in participation between a ward 1 SD below the mean and a ward 1 SD above the mean distance is 8.30%, after controlling for IMD.

4.2.4 Effects of Average Distance to Nearest HEI: Test of Robustness

The effects for nearest single HEI are slightly less significant. The R squared indicates that distance to nearest HEI explains an additional 1.7% of variance. On average a 1km increase in mean distance from nearest three HEIs is associated with 0.13% decrease in university participation. This approximately equivalent to an average 1% decrease in participation for every 10km the distance measure increases. These results suggest that averaging the nearest three measures is detecting more powerful associations, which was anticipated as proximity to one “elite” university may not benefit students with low attainment as much as proximity to several universities.

Table 3: Multiple Regression Analyses of Higher Education Participation

	Model 1				Model 2			
	B	SE	β	p	B	SE	β	p
Socio-economic Factors								
Intercept	34.924	0.115		***	34.924	0.113		***
IMD	-6.786	0.115	-0.551	***	-7.004	0.113	-0.569	***
Geographical Factor								
Mean Distance to HEIs					-2.125	0.113	-0.173	***
ΔR^2					0.029	F= (1, 7957) 351.8		***
R^2	0.304	F= (1, 7958) 3473.8		***	0.333	F= (2, 7957) 1989.4		***

Notes: IMD= Index of Multiple Deprivation, HEIs= Higher Education Institutions. ***= p< .001

Table 4. Multiple Regression Analyses of Regional Higher Education Participation- Model 3

	Model 3			
	B	s.e.	β	p
Socio-economic Factors				
Intercept	33.330	0.357		***
IMD	-7.703	0.114	-.626	***
Geographical Factors				
Mean Distance to HEIs	-0.419	0.134	-.034	**
Regions				
East of England	-1.105	0.456	-.033	*
London	11.685	0.567	.256	***
North East	2.586	0.568	.050	***
North West	4.344	0.471	.117	***
South East	-0.589	0.437	-.019	0.178
South West	-0.346	0.477	-.010	0.469
West Midlands	1.962	0.500	.047	***
Yorkshire and The Humber	1.852	0.562	.036	**
ΔR^2	0.054	F= (8, 7949) 87.933		***
R^2	0.387	F= (10, 7959) 501.996		***

Notes: IMD= Index of Multiple Deprivation, HEIs= Higher Education Institutions.
*=p< .05, **=p< .01, ***=p< .001

4.3 Regional Effects

Regions were dummy coded and the East Midlands region was selected as a baseline group, due the region being ranked in the middle third for university participation, IMD and distance to HEIs. After controlling for IMD and distance, the East of England region had the greatest negative beta-weight, which indicates that proximity to HEIs has a strong association with university participation. Compared to the East Midlands, the East of England scored -0.033 SD lower. Please see Table 4 above. East of England has the greatest regional mean distance from nearest three HEIs at 39km as indicated above. Table 5 below also indicated that the East of England regions has the second largest rural populations and is the second largest regions by area. The South East and South West regions also manifested negative beta-weights and are on average larger regions with greater rural populations.

All the remaining regions displayed positive beta-weights. This indicates that after controlling for ward deprivation and distance from HEIs, these regions have higher participation rates than the East Midlands. Significant beta-weights for London and The North West are indicative that the regions have significantly higher participation after controlling for ward deprivation and distance from HEIs. Compared to the East Midlands, London and the North West scored 0.26 and 0.12 SD above respectively. Both regions have the greatest urban population and both regions rank in top three for average university participation. London is an outlier on most variables but is particularly limited by its area and has substantially better transport networks and infrastructure investment (Arnett, 2014). The area of Greater London is 1572km. Thus the London wards that are most distant from universities remain to have relatively good access to higher education nationally. Table 2 indicates that London has the smallest regional mean distance to nearest 3 HEIs at 7.6km. Therefore even after controlling for deprivation and distance, poorer and more urban regions reveal higher average participation rates.

Table 5 Proportion of the Usual Resident Population Living in Urban and Rural Areas (2011) & Area in Km²

Regions	Urban %	Rural %	Area km²
South West	68.4	31.6	23,829
East of England	71.1	28.9	19,120
East Midlands	73.3	26.7	15,627
South East	79.6	20.4	19,095
North East	81.6	18.4	8,592
Yorkshire and The Humber	82.5	17.5	15,420
West Midlands	84.9	15.1	13,000
North West	89.4	10.6	14,165
London	99.8	0.2	1,572

Source: 2011 Census - Office for National Statistics

4.3.1 Regional Focus: London

London schools have witnessed an outstanding transformation over the last ten years, from being one of the worst performing regions to one of the best for primary and secondary education (Baars et al., 2014) . Despite acute deprivation London has the highest regional level of university participation. A greater understanding of London's success may be the key to unlocking potential elsewhere in the UK. London's data has been isolated and a separate regression analysis has been completed below. Table 6 below indicates that deprivation and distance explained 16.1% of variance, 17% less than the national regression analysis. The mean distance measure explained 0.3% of the variance ($\Delta F_{[1,\ 624]} = 120.478$; $p < .001$), which almost a tenth of the national figure of 2.9%. This betaweight for "Mean Distance to HEIs" is not statistically significant ($p = .159$). Therefore distance to university and participation does not manifest the same association as the national figures.

Table 6: Multiple Regression Analyses of Higher Education Participation: London

	B	s.e.	β	p
Socio-economic Factors				
Intercept	41.603	0.384		***
IMD	-4.438	0.414	-0.422	***
Geographical Factors				
Mean Distance to HEIs	-0.584	0.414	-0.056	0.159
ΔR^2	0.003	F= (1, 624)	120.478	***
R^2	0.161	F= (2, 625)	61.130	***

4.3.2 Regional Focus: East of England and South West

The East of England and the South West were also investigated in isolation. These regions were selected because they contrast with London in having the greatest distances to university. The mean distance to university measure in the South West is over seven times higher than London. The East of England region is unique in containing a relatively even spread of communities that are near, moderately distant and very distant from universities. Appendix R indicates that the distribution has

kurtosis of 7.58 and skew of 2.2. Please see Appendix U below, which displays the national spread of mean distance from nearest 3 HEIs. Figure 10, in Appendix U, indicates a significantly leptokurtic distribution with a strong positive skew. This contrasts with the East of England distribution shown in Figure 11, which reveals significantly lower scores for kurtosis and skew (-0.33 and 0.66 respectively, please see Appendix S). The East of England includes wards on the urban fridges of London, which have access to the greatest concentration of universities in the country. The region also contains suburban wards near the university towns of Cambridge, Norwich and Colchester and very remote rural wards on the coastal fringes. Table 7 below suggests that after controlling for deprivation, distance explains 3.1% additional variance in the East of England ($\Delta F_{[1,\ 1264]} = 66.311$; $p < .001$), which is over four times the equivalent figure for London and slightly greater than the national figure. The -0.181 beta-weight indicates that for every 5km the mean distance measure increases in the East of England, there is an average 1% drop in university attendance. This is a significant association and particularly notable in a region in which the mean distance to HEIs is 39km.

Table 7: Multiple Regression Analyses of Higher Education Participation: East of England

	B	s.e.	β	p
Socio-economic Factors				
Intercept	34.176	0.255		***
IMD	-6.787	0.262	-.575	***
Geographical Factors				
Mean Distance to HEIs	-2.132	0.262	-0.181	***
ΔR^2	0.031	F= (1, 1264) 66.311		***
R^2	0.408	F= (2, 1267) 437.711		***

The South West contrasts the results of London and the East of England because the trend of a negative association between participation and distance is not observed. Greater distance from university is associated with moderately higher rates of participation in the South West. Table 8 below indicates that for every 10km the distance measure increases there is an average 1% increase in university attendance. After controlling for IMD, distance explains an addition 1% of variance ($\Delta F=_{[1, 1087]}$ 14.703).

Table 8: Multiple Regression Analyses of Higher Education Participation: South West

	B	s.e.	β	p
Socio-Economic Factors				
Intercept	33.055	0.276		***
IMD	-5.759	0.290	-0.541	***
Geographical Factors				
Mean Distance to HEIs	1.112	0.290	0.104	***
ΔR^2	0.010	F= (1, 1087) 14.703		***
R^2	0.268	F= (2, 1089) 199.970		***

4.3.3 Regional Focus: Overview

The key statistics from the remaining regions have been compiled into Table 9 below. There are risks to carving up the dataset thus these results must be interpreted with some caution. Gerrymandering has the ability to change election results and arbitrary regional boundaries may create similar distortions. Nonetheless, several regions are relatively self-contained due to their lengthy coastlines, which decrease the probability of bias due to borderlines. Namely, the South West and the East of England.

The association between distance and university participation varies significantly across regions. In the East Midlands, the North East and Yorkshire and the Humber, mean distance to nearest three HEIs explained less than 0.001% of variance in university participation. At 3.1%, distance explained significantly more variance in the East of England region than the remaining regions, which ranged from 0.1 – 1%.

Table 9: Selected Statistics from University Participation Regional Regression Analyses

	ΔR^2	R^2	β	SE	p ‡
Regions					
East of England Mean Distance to HEIs†	0.031	0.408	-0.181	0.262	***
East Midlands Mean Distance to HEIs†	0.000	0.349	-0.021	0.370	.487
London Mean Distance to HEIs†	0.003	0.161	-0.056	0.141	.159
North East Mean Distance to HEIs†	0.000	0.477	0.012	0.457	.710
North West Mean Distance to HEIs†	0.001	0.494	-0.034	0.309	.149
South East Mean Distance to HEIs†	0.002	0.345	-0.048	0.269	*
South West Mean Distance to HEIs†	0.010	0.268	0.104	0.290	***
West Midlands Mean Distance to HEIs†	0.003	0.343	-0.055	0.343	.064
Yorkshire and The Humber Mean Distance to HEIs†	0.000	0.449	-0.002	0.429	.946
England Mean Distance to HEIs*	0.029	0.333	-.173	0.113	***

Notes: IMD= Index of Multiple Deprivation, HEIs= Higher Education Institutions.
*=p< .05, **=p< .01, ***=p< .001
† After controlling for IMD
‡ Significance of standardised betaweight

At the regional level deprivation continues to explain significantly more variance than distance, which is indicated by the difference in scores on the first and second column in Table 9 above. The strength in R squared scores above manifests a north south divide. London and the South West are only regions with a score below 0.3

and all northern regions exceed a score of 0.4. Suggesting that deprivation explains the variance in university participation to a greater extent in the North of England.
Five out of nine regions suggested that increased distance from HEIs was negatively associated with university attendance. The only regions with statistically significant negative beta weights were the two regions that border London, which may suggest that the cluster of universities is impacting the association. The greatest association between university participation and distance is the East of England (ΔR^2=0.031) stands out a key driver of the national trend.

The South West and North East revealed a contrasting trend, suggesting that university participation was positively associated with increased distance from HEIs. The South West contains the Isles of Scilly and Cornwall, which are outliers due to their remoteness and other socio-economic anomalies, which is discussed in the following chapter. When these districts are removed the beta-weight falls from 0.109 to 0.052 (p= .064) and the ΔR^2 declines to 0.003. The North East association was not statistically significant (p= .710).

4.4 Interaction Analysis

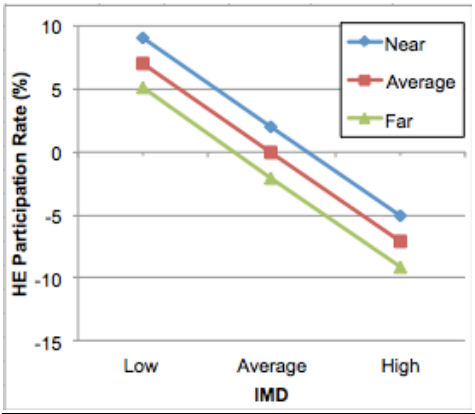
Low-income families tend to reside in cities and cities tend to host universities (Gibbons & Vignoles, 2011). The uneven distribution of universities and deprivation raises the question of an interaction effect between IMD and mean distance to nearest three HEIs. Table 10 below indicates that the interaction effects between IMD and distance were weak but statistically significant (p< .001), explaining 0.1% additional variance in university attendance.

Table 10: Multiple Regression Analyses of IMD * Mean Distance Interaction Effect

	Model 5			
	B	s.e.	β	p
Socio-economic Factors				
Intercept	34.892	0.113		
IMD	-7.086	0.118	-.576	***
Geographical Factors				
Mean Distance to HEIs	-2.013	0.122	-.163	***
Interaction				
IMD X Mean Distance	-0.320	0.128	-.257	*
ΔR^2	0.001	F= (1, 7956) 6.248		*
R^2	0.334	F= (3, 7959) 1329.205		***

University participation scores one SD above and below the mean are plotted below. Near, average and far distances also reflect scores one SD above and below the mean. The interaction effects graph below on the right indicates that students in deprived and distant wards are the least likely to attend university. The lines taper towards the top and widen towards the bottom, which contrasts with the main effects graph on the left. The interaction effect may be weak on the national data but the widening gap will be acute in the most deprived and distant wards.

Simple Main Effects



IMD*Mean Distance Interaction

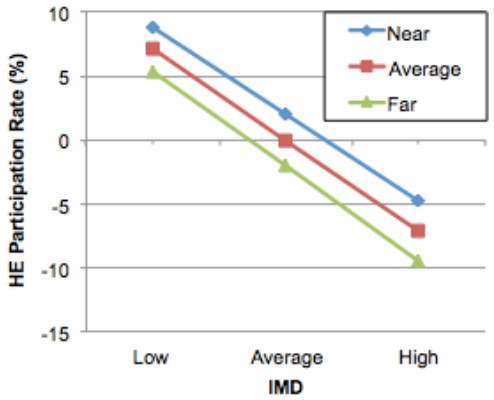


Figure 7 Mean HE Participation by Distance- Interaction Effect

4.5 Qualitative Findings

A diverse range of interviewees were recruited to provide varied perspectives on the role of proximity on university access. Table 11 below details the descriptive statistics of the ward in which the interviewees' worked. The sample draws from wards that are slightly lower than average distance to universities and participation rates and higher than average IMD scores. Seven out of nine of the English government regions are represented. Four of the interviews were conducted in large urban areas, with populations of over half a million people. One interview was conducted in a town with a population of over 100, 000 and the remaining three were conducted in towns with populations below 25, 000, the smallest of which has a population of just over 5,000 people. There was therefore an even spread of relatively rural and urban communities represented. The interview responses are embedded into the following discussion chapter.

Table 11, Background Details of Interviewees

Interviewee and Pseudonym	Place of Work	Role	Mean Distance*†	IMD†	University Participation Rate†	Region
Interviewee 1, Lonton Sixth Form	Academy with sixth form	Higher Education and Careers Manager	3.2km	40.3	35.2%	London
Interviewee 2, Westnorton College	Catholic comprehensive college	Careers Advisor	3.2km	48.2	32.9%	North West
Interviewee 3, North West University	Large post-1992 university	Widening Participation Manager	1.8km	38.1	20.3%	North West
Interviewee 4, Yorton College	Branch of city college	Personal Tutor	13.6km	59.6	19%	Yorkshire and The Humber
Interviewee 5, Wesmiton Sixth Form	Comprehensive school with sixth form	Head of Sixth Form	39.2km	11.4	51.4%	West Midlands
Interviewee 6, Mideaston Sixth Form	Comprehensive school with sixth form	Head of Sixth Form	19.3km	18.8	27.3%	East Midlands
Interviewee 7, Westsutton Sixth Form	Comprehensive school with sixth form	Teacher & Pastoral Tutor	30.3km	30.2	11.4%	South West
Interviewee 8, Aston Sixth Form	Comprehensive academy school with sixth form	Teacher & Pastoral Tutor	50.4km	8.6	18.6%	East of England

Notes: *To Nearest 3 Higher Education Institutions. †In the ward of the school/ college/ HEI

4.6 Research Question Findings

4.6.1 Research Question 1 Findings

Research Question 1: Is distance to university associated with the probability of university participation in England?

The national regression analysis of university participation generated a beta-weight of -0.173 ($p < .001$) for the mean distance variable. The null hypothesis is therefore rejected. Distance is negatively associated with university participation in England. The regression significantly improved prediction ($F_{[3, 7957]} = 1989.4$; $p < .001$) and distance explained 2.9% of variance in university attendance.

4.6.2 Research Question 2 Findings

Research Question 2: Is the relationship between distance to university and probability of participating in higher education equal across English regions?

When the dataset was segmented into regions the regression analyses generated beta-weights that ranged from -0.181 ($p < .001$) in the East of England, to 0.104 ($p < .001$) in the South West. All other regions did not produce statistically significant beta-weights, except the South East (-0.048, $p < .05$). The null hypothesis is therefore rejected. The association between distance and university participation is not uniform. The East of England manifests a substantially stronger negative association than other regions which. Distance explained 3.1% of variance in participation in the region, which is high for the field of Educational Research.

The third research question is discussed in the following chapter using the interview response data, a summary of which can be found at the end of the chapter.

Chapter 5: Discussion

5.1 Introduction

This chapter is divided into three sections. Firstly it focuses on the national and regional trends from the quantitative analysis and how the results compare to the substantive literature. The second section unpicks explanations as to why distance may be negatively associated with university attendance by discussing the results in the substantive literature with the results from the qualitative investigation. Finally, the third section addresses the research questions.

5.2 The National Trend

The regression analysis suggests that distance has a significant negative association with university participation. After controlling for IMD, for every 10km the distance measure increases there was an average 2% drop in participation. This effect, and an R squared change of 4%, is significant for the field of Education Research. Literature on the association between geography and the decision to attend university is nuanced. Several studies in similar developed economies suggest a that distance has a negative impact on university attendance (Frenette, 2004; Parker et al., 2015; Sá et al., 2006; Spiess & Wrohlich, 2010). Such studies contain reliable conclusions through robust statistical techniques, such as regression analysis and the use of large national datasets (Frenette, 2004; Parker, Jerrim, Anders, & Astell-Burt, 2015; Sá et al., 2006;). The results of this study complement the findings of similar regression analysis in Australia, Canada, Germany and the Netherlands. (Frenette, 2004; Parker et al., 2015; Sá et al., 2006; Spiess & Wrohlich, 2010).

The negative association between distance from university and attendance of university is more powerful in several international studies. Frenette states that students living over 80km away from a college[13] are 37% less likely to attend college than those living within 80km of a college (Frenette, 2004). This study has evidenced that on average, after controlling for IMD, students are 4% less likely to attend if they live on average 80km from their nearest three universities. The strength of the association varies between regions as discussed below.

[13] The approximate academic equivalent to a UK university.

Studies on Continental Europe suggest a more muted effect than those in the British Commonwealth. In the Netherlands, Sá et al. emphasised that proximity primarily mediated the type of instutution attended and that the decision to attended university was only marginally associated with distance (Sá et al., 2006). The study on German access to higher eduation suggested that the benefits of living near a university declined to zero beyond 13km radius from the universities (Spiess & Wrohlich, 2010, p. 474). However, the Netherlands and Germany both provide free public transport, and relatively generous grants and low fees, which may mitigate the influence of distance.

Significantly, Commonwealth studies highlight that students from low SES backgrounds experience a more pronounced negative association between distance and university attendance. Frenette suggests that the students from the top income tier are immune to the negative association of participation rates that middle and low income tier students appear to manifest (Frenette, 2004). Parker et al. are more direct, stating that proximity is significantly associated with university attendance "with and especially large impact upon young people from low socioeconomic backgrounds" (Parker et al., 2015). England's geographical size and population density may have more in common with the Netherlands and Germany. However, the similar wealth distributions, coupled with a relatively similar socio-economic history may mean Canada and Australia conclusions are more relevant to the UK (OECD, 2015b). Deprivation has been evidenced to be a more powerful predictor of attendance and the interaction effect in Figure 7 suggests that the association between distance and University attendance is stronger for low SES students.

5.3 Regional Trends

The negative association between attendance at university and distance was weak when compared to the association with deprivation, as Table 3 demonstrated. Gibbons and Vignoles found "a very weak link between home-HE distance and the decision to participate" in their rigorous analysis individual pupil data (Gibbons & Vignoles, 2011). However, when the regression analysis was run on each region, it revealed that a weak but significant negative association nationally was the aggregation of diverse and uneven associations at a regional level. Uncovering these regional trends may assist in understanding the mechanisms that generate the association and may also help guide more effective policies to improve access to higher education.

The remainder of the chapter focuses on three regions that stand out. Firstly, the London region, an urbanised anomaly, in which the explained variance of distance is reduced almost tenfold compared to the national figure. Secondly, the East of England region, in which distance explained more variance than any other region, at 3.1%. Finally, the South West was exceptional in providing a relatively strong positive beta-weight, which was the second most statistically significant result. The South West was one of only two regions displaying a positive association between distance and university participation.

5.3.1 Regional Analysis: London

Distances to universities in London were consistently substantially shorter, as indicated in Table 2. If distance were deterimental to university participation the explained variance and beta-weights would be expected to diminish when compared to the national statistics. The shorter distances were expected to allow greater access to university and indicate a weaker association. The results from the regression analysis confirmed diminished explained variance ($\Delta R^2 = 0.003$) and the standardised beta-weight was no longer statistically significant. However, London's explained variance remained greater than most regions, which was not anticipated.

The minor association may be due to the distribution of transport infrastructure. HEFCE launched a "National Collabourative Outreach Programme" this year to tackle communities where higher education participation is "lower than would be expected given GCSE (KS4) attainment rates" (HEFCE, 2016a). HEFCE have selected target wards based on participation figures that are significantly lower than forecast. The majority of London wards have a station with direct services into central London yet 85% of the HEFCE's target wards in the capital do not. Four out of thirteen of the target wards have a rail station but two of these are tramlink stations that lead only to satellite suburbs such as Croydon, which has no HEI. Not one of the target wards enjoys the regular services of a London Underground line. In a region with low car ownership, public transport infrastructure may determine university access. This may be the cause of the diminished association.

5.3.2 Regional Analysis: The East of England

The East of England region contains contrasting communities, which may be best understood in three horizontal thirds; continuing the border between Essex and Suffolk westward provides the southern third. The middle and northern third may be defined as border between Suffolk and Norfolk continued westward.

In the southern third of the region the population has access to five main line railways and several motorways that allow residents to commute to London (Corke & Wood, 2009). These connections also open up opportunities to study in London and allow access between universities across the country and students' hometowns. Frequent services on tube lines and suburban railways attract professionals and allow locals access to the London jobs market, which raises the aspirations of the community. The southern third of the region has four universities as displayed in Figure 2.

Across the middle band of the region motorways come to an end or enter other regions, rail and road journey times to London increase to over one hour. Rail services become less frequent and the network becomes more sparse. Thus, commuting to capital becomes unattractive and less common. This middle third of the region hosts two universities, both in Cambridge, which is connected by motorway only to the South.

Finally, the northern third of the region has the sparsest population and is relatively isolated from the rest of the UK (Corke & Wood, 2009). This northern third contains one multi-faculty university, which is situated on the outskirts of Norwich. There are no motorways in this third of the region and trains are less frequent, at one an hour. Schools struggle to recruit good teachers to move to this relatively remote part of the country (Isaac, 2016).

No other region demonstrates the division between metropolitan and dynamic hinterland of London and the remote and rural provinces as well. The ONS classify built up areas into five bands[14] and the East of England is the only region to not contain one of the eleven major or large built-up areas[15] (Stokes, 2013). The level of urbanisation diminishes towards the north of the region, as distances to universities increase also.

[14] Minor, Small, Medium, Large and Major
[15] With the exception of a small fraction of the London conurbation.

The fact that the only regions with significant negative beta-weights border London, may indicate that the association is the result of student's benefiting from access to London's universities and superior transport infrastructure.

5.3.3 Regional Analysis: The South West

The South West has similarly remote communities and only one large built-up area (Bristol), according to the ONS (Stokes, 2013). However, the distribution of infrastructure is more consistent. The M5 motorways links universities in Cheltenham, Bristol, Bath and Exeter. Living near this motorway but not necessarily near a university may provide greater access than living in a rural community nearer universities.

Tourism is a significant portion of the South West economy, it receives more tourists than any other UK region or country (Smith, 2010). Tourism is associated with low skilled and seasonal jobs. The region therefore has the highest number of part-time workers (Smith, 2010). Tourism is most prevalent in coastal regions and especially Cornwall. Cornwall is also unique for having particularly high house prices for a remote rural area, that are reported to be double the England and Wales average in 2014 (Norwood, 2014). The Dorset and Devon coast have similarly high house prices, when compared to local wages. The marinas of the south coast of Cornwall have attracted the wealthy from London and the South East, who because of the internet and flights to London via Newquay Airport are able to maintain London jobs in Cornwall. For many local Cornish, the only opportunity buy a house is to move away to university and seek graduate employment.

As stated in the previous chapter, when Cornwall and the Isles of Scilly are removed from he regional regression analysis the beta-weight value diminishes from 0.109 to 0.052. Cornwall's combination of low wage, seasonal jobs and high house prices seems to act as an additional incentive for students to leave the region by attending university. The controls for IMD may be flawed for Cornwall as the IMD is based on income and barriers to housing (amongst other indictors). The assets of wealthy retirees or residents, who may sacrifice a higher salary, to move to Cornwall, and other attractive coastal areas, are not accounted for in the income measure of IMD. The anomalous geography as a peninsula and a reliance on low-income jobs in tourism may explain why students in remote districts of the South West have a

greater probability of attending university. Alternatively, the trend may be explained by relatively poor advantages to living near a university in the South West.

5.4 The Relationship between Distance and University Access

5.4.1 Financial Transactional Costs

Students living further away from universities incur greater costs in participation through travel and relocation. Britain is unusual with its tradition of students moving away to university yet there is evidence of a rise in students choosing to remain at home to complete their degrees (Christie, 2005; Gibbons & Vignoles, 2011). The cost of relocation may be avoided if a student remains at home yet students living in distant localities may not have this option. Of the students that remain at home to study, those living nearer to their university will have lower commuting costs. Relocation costs are increased for more distant students by increased travel costs but also less obvious costs, such as the ability to use facilities at home, such as washing machines. Finally the cost of visiting home is reduced the closer a student's university is to their home.

Spiess and Wrohlich suggest that the negative association between university participation and distance in Germany is attributed to transactional costs (Spiess & Wrohlich, 2010). Costs such as purchasing furniture, rental costs and the loss of economies of scale in the family household are highlighted in the research (Spiess & Wrohlich, 2010). Choosing to remain at home for university is a method of controlling risk suggests Christie and there is evidence that the proportion of students choosing to remain at home is increasing with the rise in tuition fees (Christie, 2005; Gibbons & Vignoles, 2011).

Evidence in the substantive literature suggests that low income students geographically restrict their university applications (Mangan et al., 2010). Gibbons and Vignoles demonstrate that low income students travel shorter distances to university in the UK and that this has restricted entry to higher status institutions (Gibbons & Vignoles, 2011). Frenette and Parker et al. suggest that low income families are more disadvantaged from their distance to a university (Frenette, 2004; Parker et al., 2015) . Frenette states "The patterns of university and college participation by family income and distance to school are consistent with the notion that added costs deter students in less favourable economic circumstances from

pursuing a university or college education" (Frenette, 2004, p. 440). The interaction effect displayed in Figure 7, in the previous chapter, suggests a double disadvantage for deprived students living a significant distance from university. This complements the findings of articles cited above. This double disadvantage for deprived students is indicative of the fact that financial circumstances play a significant role in a students decision to attend university.

5.4.2 Interview Responses: Financial Transactional Costs

Financial issues were a persistent and reoccurring theme within the interviews. When asked "What do you think are the main obstacles for attending university for your students?" all but one[16] interviewee referred to financial challenges. These financial challenges were identified under different labels including "debt aversion", "student finance" or simply "money".

Staff persistently cited the struggle to explain student financial support and the fee structure. "We do have some students who will not consider university because of the cost no matter how well you explain the support package that's on offer" (Mr Palatine, Westnorton College). The perceived cost of university was presented as a greater barrier than the cost itself.

> "For a number of our students, whose parents haven't been to university myths surrounding student finance tend to put a lot of students off i.e. they're going to be in a lot of debt, that there's not much support available and that seems to be the biggest concern when we're talking to students about university"
> (Ms Middlesex, Lonton Sixth Form)

When asked "Does the proximity of the nearest university affect your student's decision to attend university or not?" all interviewees suggested that distance had a negative effect. In Westsutton Sixth Form the member of staff responded "For an awful lot of them I think it does because I think they view it from a financial point of view. However, those students where money isn't so much of an issue I don't think it does". This wealth determined division compliments the findings of Frenette and Parker et al. and the interaction effect displayed in the previous chapter (Frenette, 2004; Parker et al., 2015).

[16] Low aspirations were cited as a barrier from the remaining respondent. (Mideaston Sixth Form

The decision to remain at home was considered to be motivated by financial circumstances by all respondents. One of the most remote localities included in the interview sample was Westmiton Sixth Form, which had a mean distance to nearest three HEIs of 39km. Students were said to commute for two or three hours a day to ensure that they could remain at home. “There are still lots of students who say I’m not going to live in this year, I’m going to drive and see how it goes. They tend to attend locally for financial reasons as well as a kind of insecurity” (Westmiton Sixth Form). The Widening Participation Manager of North West University also suggested that some students wished to study in their local area so they could maintain their part-time job to subsidise their studies. Ms Anglia also identified part-time jobs as a barrier for attending open days. Students in the East of England would need a full days travel to visit all but their nearest university. All weekends were taken up with part-time work, which substantially limited open day opportunities.

Interviewees referred to costs incurred on travelling between university and home “I think also how much it’ll cost them to get home and if they’ve been to an open day and they’ve worked out the travel costs then that’s a factor too. I think cost is a big thing” (Westmiton Sixth Form). Cost and duration of travel between university and home was also raised as a primary factor for students in Mideaston Sixth Form.

5.4.3 Social Costs

Distance costs cannot be reduced to purely financial variables. There are less quantifiable social costs that distance may engender. In Christie’s qualitative study of students studying from home, participants explain how social and economic costs are calculated citing parental support and averting homesickness as reasons for remaining at home (Christie, 2005). Quantitative studies in Germany and Canada identified the emotional cost as students leave “network of family and friends or may be unprepared to leave home” (Frenette, 2004, p. 428; Spiess & Wrohlich, 2010)

The social cost of distance may be greatest for those that need to travel furthest for university. Parker et al. conclude that the social and emotional cost to moving away is greater for students in rural districts in Australia because there is a greater sense of community (Parker et al., 2015). Distance explained the greatest variance in higher education participation in the East of England region ($\Delta R^2 = 0.031$), which drove the national trend. This may be due to the contrast of dynamic, metropolitan

Home Counties in the south of the region and rural, farming communities in East Anglia.

5.4.4 Interview Responses: Social Costs

Interview respondents suggested that social costs were significant considerations for students. There was a distinction between the small towns and the large cities that the interviews were taken. In the smaller towns that were also more distant from universities, references to the social costs were more frequent and more pronounced. Relatively static demography resulted in generations of families living in close proximity and closer-knit communities, which increased the social cost of moving away.

> "Westmiton doesn't seem to have had much geographical mobility, so you tend to have generations of families living here, more so than other parts of the country. So I think it's not just leaving your parents, it's leaving granny and grandpa and cousins and I think that makes a difference too"
> (Ms Mercia, Westmiton Sixth Form)

> "It's a complete lack of confidence. They don't travel…It's about aspirations, they live in a very nice rural community where it's very supportive and generations have lived there. So they're quite happy to stay in their comfort zone really. That's the difficulty for teachers who are trying to raise standards and aspirations actually. To get them to think beyond the local area."
> (Ms Anglia, Aston Sixth Form)

Leaving home to go to university takes students outside of their support network, which was perceived as not only a brave step of independence but also a step into the unknown. Again issues of fear and insecurity were primarily raised in the smaller towns.

> "For an awful lot of them it's also quite a frightening prospect because they've never had anyone in their family that's been to university, they've never had anyone in their family that's moved away."
> (Ms Wessex, Westsutton Sixth Form)

The measures of deprivation are relatively low in the wards that Aston and Westmiton Sixth Form are situated and average in Mideaston Sixth Form, as displayed in Table 11 above. In the previous chapter and in the wider literature lower deprivation is observed to be associated with higher university attendance (Frenette, 2006; Gibbons & Vignoles, 2011; Parker et al., 2015). However, a relatively rural and

insular community not only strengthens ties to hometowns but also seems to foster perceptions of danger outside the town.

> "Its a much bigger decision now the fees have gone up to nine thousand pounds…so I think that's the main thing preventing them. The other thing I think is because of the insular nature of Westmidshire, is students are a bit frightened to leave home."
> (Ms Mercia, Westmiton Sixth Form)

> "It's a town of 20 odd thousand people, where a lot of people know each other. It's a very safe environment. It's close to [Norcaster] but far enough away and students feel very safe in this environment and it's easier for them to commute into those areas but not have to live there"
> (Mr Sherwood, Mideaston Sixth Form)

Westmiton is described by Ms Mercia as insular but also noted for its advantage of being central in the country. Its distance measure was approximately a third of a standard deviation above the national mean. There are therefore thousands of communities that are more remote and potentially more insular. This concern for safety or fear of moving away was not mentioned in interviews conducted in the larger cities. Possibly the greater exposure to dynamic and diverse communities, as well as a greater connectivity to other regions, diminishes the fears of life outside their home community. Most universities are based in cities with dynamic and diverse communities (even the universities based in smaller towns create more diverse and dynamic communities around them). The more remote a community is, the more distant it is likely to be from a university and the less exposure students will have to the world outside their village. Therefore fear of moving away may be greatest in the most remote communities. This theory would complement the negative association calculated in the regression analysis.

The social cost of distance was observed to restrict selection of courses and universities. Mr Sherwood suggested that how long it takes to get home was one of the most important factors for students, alongside how much it costs. The duration of travel time between home and university is a factor related to social costs as well as financial costs. Ms Mercia depicted a similar situation.

> "Distance is a factor students for instance going south, people have been down to Falmouth for instance for Graphics, which is fantastic and they come back and say "it's too far". "I can't get back quickly enough" so there's that

> kinda of sense that if there's an emergency it'll take them six hours to get back, which isn't very far but it is when you're seventeen"
> (Ms Mercia, Westmiton Sixth Form).

5.4.5 Cultural Issues

Previous studies into distance and higher education participation have demonstrated that distance does not impact all ethnic communities equally. Gibbons and Vignoles highlight that British Indian female students travel on average twice the distance to university compared to their British Pakistani and Bangladeshi peers (Gibbons & Vignoles, 2011). Parental pressure to remain at home in some cultures may be an additional barrier. Government reports have noted access to HE as an issue to communities that may wish to remain at home for university but have poor geographical access to HEIs, such as Burnley Lancashire (Cantle, 2001). In the UK most ethnic minority communities are located in large conurbations near HEIs, which is why Gibbons & Vignoles suggest ethnic minorities are over represented at "high status"[17] universities (Gibbons & Vignoles, 2011). However, there are demographic anomalies, such as the Pennine mills towns of Lancashire and Yorkshire, which have a large, relatively rural British Pakistani population. In such regions ethnicity and distance from HEIs may be a double disadvantage.

5.4.6 Interview Responses: Cultural Issues

Cultural and religious influences on access finance were identified as one of primary barriers to university participation at Westnorton College. The College is situated in a ward with relatively high deprivation but is in the top 1% for the mean distance to HEI measure. However, cultural customs are persuading students to consider alternative avenues to university.

> '"We have a high number of students here who are Muslim and have an issue with the interest that's added to the student loan, which has caused them to maybe reconsider some of the avenues that they were going to go down as well."
> (Mr Palatine, Westnorton College)

[17] Defined by the 24 Research Intensive Russell Group Universities

Interview respondents highlighted finance as the most significant barrier to participation. The additional costs of distance have been identified as a significant financial barrier. The combination of increased costs as a result of distance and poor access to finance due to cultural and religious factors may increase the association between proximity and higher education access.

Cultural practices were also identified as a reason for students choosing to remain at home for study. The quotation below is also from Westnorton College thus local undergraduate options were plentiful. However, students from corresponding cultural backgrounds in remote districts may encounter an increased disadvantage through pressure to stay at home.

> Interviewer: “Does the proximity of the nearest university affect your student’s selection of university?”
>
> Careers Advisor: “It does to some extent. So those students who are looking at the Millcaster Access Programme probably apply for that because they have to stay local and apply to a local institution. Part of that though may be parent pressure, it may be cultural reasons as well. So those sort of combined have an effect.”
> (Mr Palatine, Westnorton College)

Parental pressure and cultural reasons were not the only reason students chose to remain at home to study. Student’s from Westmiton Sixth Form were prepared to travel significant distances to remain at home in order to save money, commuting for over 3 hours in some cases. The Head of Sixth Form explained that students were frightened of moving away. Parker et al. suggested that small rural communities have stronger ties that encourage them to remain. Students that commute to university frequently become more isolated because they exclude themselves from the social aspects (Yorke & Longden, 2004). In addition, students that commute further have less time and money to invest in the social life of their course. Social isolation leads to a greater probability of withdrawing from their course (Yorke & Longden, 2004). Therefore student commuters that live more remotely may find themselves more socially isolated and more likely to withdraw from their programme.

5.4.7 Interview Responses: Summary

The decision to attend university is complex and multifaceted. The experts interviewed did not provide examples of students that chose not attend solely due to their remote location or students that were only attending university because of their close proximity. Such two-dimensional students do not exist. The concept of distance was not mentioned by interviewees without being prompted. However, all interviewees responded that distance to university was a barrier to attendance and many provided examples of how distance restricted choice and increased financial and social costs. These epiphenomena of distance are the practical consequences to which students are challenged.

The final research question asked, “How does distance influence student decisions on university attendance?”. Financial considerations were identified as the main concern for students when deciding whether to apply to university. Distance increases costs to travel between university and home and through less direct mechanisms mentioned above. Distance also limits the number of open days that a student is able to attend. The interview responses and the substantive literature suggested that social costs increase in more remote districts, where students seem happy to “stay in their comfort zone”. Finally, the combination of cultural influences and distance may act as a barrier to higher education.

Chapter 6: Conclusion

6.1 Conclusion

This research project has investigated the relationship between geographical distance to university and participation. The study employed a mixed methods research design combining a regression analysis and a constant comparative method of analysis of interview responses. The research questions aimed to calculate the association between distance and university participation, to investigate the variation of this relationship across English regions and to explore how distance impacts students' decisions on university application.

University access has important implications for social mobility and for identifying and training a workforce for the economy. Fair access is the cornerstone of an egalitarian society and engenders social cohesion. Programmes to widen participation among unrepresented groups have increased alongside tuition fees but current initiatives do not recognise remote students as an unrepresented group (Chowdry et al., 2010; Morrison, 2011). Grants to cover relocation or financial support to cover travel to HEIs do not exist in England as they do in other European countries (Spiess & Wrohlich, 2010).

The regression analysis revealed a significant negative association between mean distance to HEI and university participation, after controlling for deprivation. For every 6km the mean distance measure increased, a 1% decline in probability of attending university was observed. The regional analysis suggested only regions bordering London produced statistically significant negative associations, which may indicate a proximity to London advantage. The project was inspired by concerns that large northern towns without universities were disadvantaged. However, distance explained the greatest variance in the East of England, at 3.1%. An interaction analysis of Distance X IMD suggested that remote and deprived students suffered a double disadvantage ($F = {}_{(1, 7956)}$ 6.248, $p < .05$).

Interview responses identified transactional and social costs as potential disadvantages due to distance for remote students. Finance was highlighted as the most significant barrier to higher education and a potential additional expense for students in distant communities. Students in more rural locations were recognised to have closer ties to their locality, as they lived alongside generations of family and had

few opportunities to leave their hometown. These factors engendered a stronger bond, which may explain why students in remote communities are less likely to attend university. Cultural factors were also identified as a factor that impacts ethnic minority students. Parental pressure to remain at home and different cultural approaches to finance may provide challenges for ethnic student's living far from universities. However, ethnic minorities remain well represented in higher education, possibly due to their demographic concentration in large cities (Gibbons & Vignoles, 2011). Therefore the proportion of the population that are disadvantaged by distance and cultural issues may be small.

The investigation provided a further indication that measures of deprivation correlate with university participation and that the association is particularly strong in the North of England. The finding that the probability of attending university diminishes with distance to HEI is particularly important because geography is underreported and not part of the widening participation agenda (Chowdry et al., 2010). This may be particularly topical in light of the recent Brexit vote, in which rural regions predominantly voted for Brexit. The vote has been interpreted as a protest against a "metropolitan elite" and anger at poorer access to university places, and subsequent opportunities, may form part of this debate (The Economist, 2016).

6.2 Limitations

The decision was made to measure the direct distance between the each ward and selected HEIs. This calculates the shortest distance between each ward and HEI but may not reflect the exact distance travelled due local geography. There are strengths and weaknesses in all forms of measurement. An aggregation of all modes of transport or a more sophisticated modal would be a superior measurement tool. Unfortunately, this was beyond the scope of the study. Direct distance measures have been revealed to be highly correlated with other measures, such as the rail network (Gibbons & Vignoles, 2011). Therefore this method should not threaten the validity of the broader trends.

The regression analysis used aggregated data from students that entered higher education between 2006 and 2011. This data was is at least five years out of date with the interview data that was collected. England has not experienced rapid social change in the intervening years, therefore the time lapse may not be a concern. A

more recent dataset with statistics on each student would provide more robust findings and interviews from corresponding years would be optimal.

Finally, the sampling method for the interviews was unrepresentative and the sample size was small. This may have limited or skewed the issues with distance that were raised. A larger and more representative sample with students may have established clearer mechanisms of how distance impacts on the decision to attend university.

6.3 Policy Implications

In the UK, distance to university is not recognised as a disadvantage. There are therefore several policy implication in light of this study. If the government wished to provide equal access to university across the country it could implement a number of changes to support students in higher education cold spots. Firstly, offering subsidies or free transport to students to allow travel to and from university. In the Netherlands all students are entitled to a free rail pass and the association between distance and attendance is not observed (Sá et al., 2006).

Financial support could be assessed on not only income but also locality. Spiess and Wrohlich note that the stronger negative association between university participation and distance for low income families does not feature in Germany as it does elsewhere (Spiess & Wrohlich, 2010). Financial support that is dependent on relocation costs and parental income is suggested as the reason for this disparity. This may appear to be a substantial cost but the cost of a poorly skilled and uneducated workforce may be greater. Grants to students from communities that are distant from universities may not only provide an incentive but also raise awareness of the issue. Indeed raising awareness is a policy implication in itself. The issue needs to be recognised before it can be tackled.

Improving distance learning has been suggested as a solution by researchers in Germany (Spiess & Wrohlich, 2010). Gibbons and Vignoles suggest encouraging higher-quality institutions to conduct outreach further afield (Gibbons & Vignoles, 2011). These are low cost options that could assist non-traditional students with various obstacles to learning. However, students that are less engaged with their university have a higher probability of not completing their degree (Yorke & Longden, 2004). Therefore distance learning is possibly a less preferable mode of study.

Placing the onus on universities has the potential to exacerbate the regional divide. A holistic national approach may be more appropriate.

Finally, access could be improved by opening universities in regions with disproportionately few higher education institutions. Encouraging local colleges to offer basic degree courses could be a sustainable method to achieve this goal. Coastal communities have been identified as disproportionately economically deprived. Many are far from universities and have no opportunity to commute. Expanding their colleges to offer university courses or establishing a university may have immeasurable benefits.

6.4 Further Research

The findings suggest that as distance from universities increases the probability of attending university decreases. Studies suggest that as fees increase the number of students choosing to remain at home is increasing (Gibbons & Vignoles, 2011). Further research could investigate if the association of distance and participation is increasing and determine if financial circumstances impact on the association.

Finally, the regional findings highlight that students in remote wards in the East of England have the lowest probability of attending university, after controlling for IMD. The South West produced contrasting statistics. A comparison between these two rural regions could be a focus for further research. A deeper understanding of the South West phenomenon may be able to assist university access for rural students in the East of England. Similarly, the South West universities may be able to learn how to improve access for students in wards near universities.

Appendices

Appendix A

Omitted Specialist and Minor Registered Universities

The Arts University College At Bournemouth
Birkbeck College
Bishop Grosseteste University College Lincoln
Central School of Speech and Drama
College of St Mark & St John
Conservatoire for Dance and Drama
Courtauld Institute of Art
Cranfield University
Falmouth University
Guildhall School of Music and Drama
Harper Adams University
Heythrop College
Imperial College of Science, Technology and Medicine
Institute of Cancer Research
Institute of Education
Leeds College of Art
Leeds College of Music
Leeds Trinity University
Liverpool Institute of Performing Arts
London Business School
London School of Economics and Political Science
London School of Hygiene & Tropical Medicine
Northern School of Contemporary Dance
Norwich University of the Arts
Plymouth College of Art
Ravensbourne
Rose Bruford College
Royal Academy of Music
Royal Agricultural University
Royal College of Art
Royal College of Music
The Royal College of Nursing
The Royal Veterinary College
St George's Hospital Medical School
St Mary's University, Twickenham
School of Oriental and African Studies
The School of Pharmacy
Trinity Laban
University College Birmingham
University College for the Creative Arts
University of Buckingham
University of Cumbria
University of the Arts London

Appendix B: Correspondence Template

Understanding Barriers to University Participation

Dear [Insert Participant's Name]

We are conducting interviews as part of a research study to increase our understanding of barriers to university participation in communities in [insert region]. As the Head of Sixth Form you are in an ideal position to communicate the considerations and challenges that students in your school face when applying to university.

The interview takes approximately 35 minutes and is informal. Your response will be kept confidential. The results of this research will form the basis of a Masters dissertation and hopefully lead to a greater understanding of barriers affecting students' university participation.

If you are willing to be interviewed please suggest a time and date that suits you between [insert dates] and I'll do my best to accommodate the time that best suits you. If you have any further questions do not hesitate to get in touch.

I very much hope you will be able to assist in this research. If you have an queries please do not hesitate to contact me or my supervisor, [redacted], at [redacted]@education.ox.ac.uk

Kind regards

[redacted]

[redacted]@education.ox.ac.uk

Appendix C: Interview Questions

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Understanding Barriers to University Participation
Draft Interview questions

Q1. Please can you tell me a little bit about the School/College. For example the intake, catchment area and courses on offer.

Q2. How long have you been working in your current role?

Q3. What is your role in relation to university applications?

Q4. Can you tell me a little about where students move onto after leaving this school?

Q5. Of the student that progress to university, what kind of universities do they attend? (Russell group or post 1992 institutions, local or regional?)

Q6. Which university, would you estimate, has the highest number of applications from this school?

Q7. What do you believe are the main obstacles to attending university for students from this school?

Q8. Discounting financial challenges what do you believe are the main obstacles to attending university for students from this school?

Q9. What do you believe are the main obstacles to attending university for students from this community?

Q10. How do the barriers of students in this community compare with barriers for other students in the region or nation?

Q11. Does the school engage with any university widening participation schemes? If so which universities?

Q12. Does the proximity of the nearest university affect your student's selection of university? If so how?

Q13. Does the proximity of the nearest university affect your student's decision to attend university or not? If so how?

Q14. Why might students from this community choose to study at their nearest university?

Q15. What do you believe is the greatest predictor of university attendance?

Q16. Do you have any questions or is there anything you'd like to add?

Appendix D: Interview Questions (University Widening Participation staff)

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Understanding Barriers to University Participation
Draft Interview questions

Q1. Please can you tell me a little bit about the University. For example the intake, catchment area and courses on offer.

Q2. How long have you been working in your current role?

Q3. What is your role in relation to university outreach/widening participation?

Q4. Can you tell me a little about where students the typical [INSERT UNIVERSITY] student comes from?

Q5. Prompt. Which type of schools (Comprehensive, grammar, private)?

Q6. Which Local Authority do you think you receive the greatest number of applications from?

Q7. What do you believe are the main obstacles for local students wishing to attend university?

Q8. Discounting financial challenges what do you believe are the main obstacles to attending university for students from this school?

Q9. What do you believe are the main obstacles to attending university for students from this community?

Q10. How do the barriers of students in this community compare with barriers for other students in the region or nation?

Q11. Does the University engage with schools through widening participation schemes? If so in which Local Authorities and which type of schools?

Q12. Do you think that proximity influenced current students to select this university for application?

Q13. Do you think that proximity may deter students living further afield?

Q14. Why might students from this community choose to study at their nearest university?

Q15. What do you believe is the greatest predictor of university attendance?

Q16. Do you have any questions or is there anything you'd like to add?

Appendix E: Participant Information Sheet

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Understanding Barriers to University Participation
Information for Participants

What is the purpose of the study?

This study aims to explore and better understand the barriers to university participation and how they impact communities. Over the last twenty years the UK government has encouraged the expansion of university participation yet the additional uptake has not been evenly shared. Certain communities have substantially increased university participation while others have seen little or no change. This investigation aims to gain a better understanding of the participation gap between areas of high and low socio-economic deprivation.

Why have I been asked to participate?

For this study we are seeking the perspectives of education professionals involved in overseeing students transition from secondary to higher education. Staff have been selected in the hope that an objective and broad understanding of access issues may be obtained. Staff have the benefit of oversight of the routes to Higher Education or otherwise of a variety of students which should give a broad perspective.

Do I have to take part? What will taking part in the study involve?

It is your decision to take part in this study or not. If you do take part you can decide to stop participating at any time. You do not need to answer questions that you do not wish to. You will not be individually named in any report and every effort will be made to preserve the confidentiality of all respondents. The benefits of the project are helping to further the understanding of barriers to participation in higher education, which may assist in developing policies that boost access to university for all.

How will my interview be used?

The results of this research will form the basis of a Masters dissertation. If you wish to obtain a copy of the published results, please inform the researcher. The study will take place over the coming months and will be completed this summer.

What should I do if I have any concerns or complaints?

If you have a concern about any aspect of this project, please contact the researcher at [redacted] who will do his best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how he intends to deal with it.

If at anytime you are unhappy or wish to make a formal complaint, please contact the chair of the Research Ethics Committee at the University of Oxford (Chair, Social Sciences & Humanities InterDivisional Research Ethics Committee; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD). The chair will seek to resolve the matter in a reasonably expeditious manner.

Contact for Further Information or Follow-up
Should you have any further questions about this research, please feel free to contact: [redacted] or my supervisor, [redacted] k. Your inquiries are most welcome.

Appendix F

Table 12: SPSS National Regression Analysis of University Participation Model Summary

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin–Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.551[a]	.304	.304	10.2686%	.304	3473.760	1	7958	.000	
2	.577[b]	.333	.333	10.0494%	.029	351.837	1	7957	.000	
3	.623[c]	.388	.387	9.6371%	.054	87.933	8	7949	.000	1.952

a. Predictors: (Constant), Normal Score of IMD using Blom's Formula

b. Predictors: (Constant), Normal Score of IMD using Blom's Formula, Normal Score of mean_distance_km using Blom's Formula

c. Predictors: (Constant), Normal Score of IMD using Blom's Formula, Normal Score of mean_distance_km using Blom's Formula, Region=Yorkshire and The Humber, Region=West Midlands, Region=North East, Region=North West, Region=East of England, Region=South East, Region=London, Region=South West

d. Dependent Variable: Young participation rate

Appendix G

Table 13: SPSS National Regression Analysis of University Participation, ANOVA with F statistics

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	366285.782	1	366285.782	3473.760	.000[b]
	Residual	839120.261	7958	105.444		
	Total	1205406.04	7959			
2	Regression	401818.256	2	200909.128	1989.371	.000[c]
	Residual	803587.786	7957	100.991		
	Total	1205406.04	7959			
3	Regression	467151.602	10	46715.160	502.996	.000[d]
	Residual	738254.440	7949	92.874		
	Total	1205406.04	7959			

a. Dependent Variable: Young participation rate

b. Predictors: (Constant), Normal Score of IMD using Blom's Formula

c. Predictors: (Constant), Normal Score of IMD using Blom's Formula, Normal Score of mean_distance_km using Blom's Formula

d. Predictors: (Constant), Normal Score of IMD using Blom's Formula, Normal Score of mean_distance_km using Blom's Formula, Region=Yorkshire and The Humber, Region=West Midlands, Region=North East, Region=North West, Region=East of England, Region=South East, Region=London, Region=South West

Appendix H

Table 14: SPSS National Regression Analysis of University Participation, Coefficients Table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	34.924	.115		303.442	.000		
	Normal Score of IMD using Blom's Formula	-6.786	.115	-.551	-58.939	.000	1.000	1.000
2	(Constant)	34.924	.113		310.059	.000		
	Normal Score of IMD using Blom's Formula	-7.004	.113	-.569	-61.833	.000	.989	1.011
	Normal Score of mean_distance_km using Blom's Formula	-2.125	.113	-.173	-18.757	.000	.989	1.011
3	(Constant)	33.330	.357		93.404	.000		
	Normal Score of IMD using Blom's Formula	-7.703	.114	-.626	-67.680	.000	.901	1.109
	Normal Score of mean_distance_km using Blom's Formula	-.419	.134	-.034	-3.122	.002	.647	1.547
	Region=East of England	-1.105	.456	-.033	-2.423	.015	.419	2.386
	Region=London	11.685	.567	.256	20.624	.000	.502	1.993
	Region=North East	2.586	.568	.050	4.549	.000	.632	1.582
	Region=North West	4.344	.471	.117	9.233	.000	.477	2.095
	Region=South East	-.589	.437	-.019	-1.347	.178	.399	2.503
	Region=South West	-.346	.477	-.010	-.725	.469	.434	2.306
	Region=West Midlands	1.962	.500	.047	3.926	.000	.540	1.851
	Region=Yorkshire and The Humber	1.852	.562	.036	3.297	.001	.633	1.581

a. Dependent Variable: Young participation rate

Appendix I

Table 15: SPSS National Regression Analysis of University Participation, Casewise Diagnostics

Casewise Diagnostics[a]

Case Number	Std. Residual	Young participation rate	Predicted Value	Residual
486	3.185	52.8%	22.108%	30.6918%
650	3.299	59.1%	27.309%	31.7911%
841	5.388	75.0%	23.071%	51.9289%
913	3.269	58.0%	26.493%	31.5067%
1834	3.519	62.1%	28.184%	33.9163%
2060	3.720	64.0%	28.152%	35.8483%
2870	3.074	58.9%	29.271%	29.6290%
3100	3.887	66.7%	29.238%	37.4621%
3179	3.410	66.7%	33.838%	32.8616%
3641	3.161	62.1%	31.637%	30.4629%
3772	3.001	60.8%	31.879%	28.9210%
3806	3.116	64.9%	34.868%	30.0323%
3900	3.708	68.0%	32.266%	35.7336%
4143	3.071	62.1%	32.508%	29.5923%
4280	3.247	68.8%	37.508%	31.2918%
4367	3.605	72.3%	37.557%	34.7431%
4434	3.012	65.9%	36.873%	29.0273%
4520	3.099	66.1%	36.231%	29.8694%
4749	3.269	69.2%	37.693%	31.5075%
4772	3.132	65.3%	35.113%	30.1874%
4834	3.222	68.9%	37.851%	31.0490%
5106	3.603	70.1%	35.380%	34.7202%
5109	3.208	69.6%	38.679%	30.9205%
5329	3.004	65.0%	36.055%	28.9454%
5734	3.341	69.1%	36.898%	32.2023%
6035	3.331	70.5%	38.402%	32.0977%
6134	3.454	72.6%	39.310%	33.2904%
6323	4.015	78.0%	39.302%	38.6978%
6562	3.394	72.3%	39.589%	32.7108%
6675	3.022	69.6%	40.477%	29.1228%
6728	4.181	81.2%	40.905%	40.2955%
6762	3.109	69.9%	39.935%	29.9650%
7650	4.209	87.2%	46.634%	40.5657%
7763	-3.088	18.3%	48.061%	-29.7605%
7828	3.597	84.1%	49.439%	34.6608%

a. Dependent Variable: Young participation rate

Appendix J

Table 16: SPSS National Regression Analysis Residual Statistics

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	7.888%	61.966%	34.924%	7.6613%	7960
Std. Predicted Value	-3.529	3.530	.000	1.000	7960
Standard Error of Predicted Value	.249	.574	.352	.065	7960
Adjusted Predicted Value	7.863%	61.987%	34.924%	7.6613%	7960
Residual	-29.7605%	51.9289%	0.0000%	9.6311%	7960
Std. Residual	-3.088	5.388	.000	.999	7960
Stud. Residual	-3.090	5.391	.000	1.000	7960
Deleted Residual	-29.8060%	51.9838%	0.0000%	9.6444%	7960
Stud. Deleted Residual	-3.092	5.401	.000	1.000	7960
Mahal. Distance	4.310	27.239	9.999	4.077	7960
Cook's Distance	.000	.004	.000	.000	7960
Centered Leverage Value	.001	.003	.001	.001	7960

a. Dependent Variable: Young participation rate

Appendix K

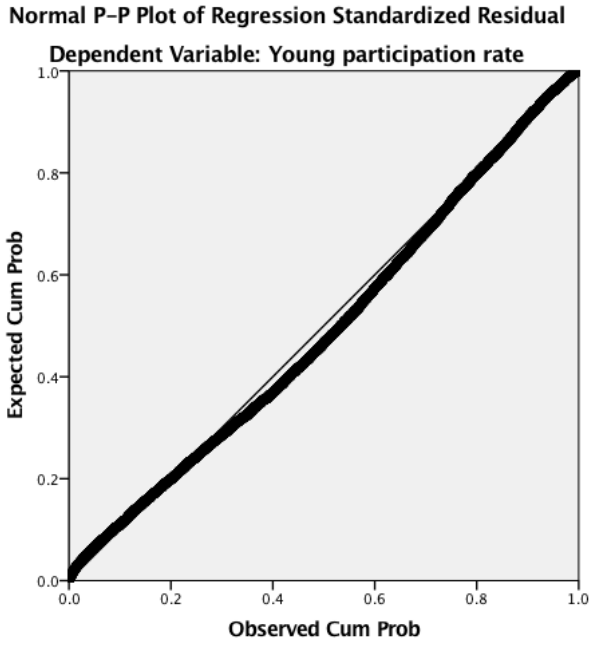


Figure 8: SPSS National Regression Analysis P-P Plot

Appendix L

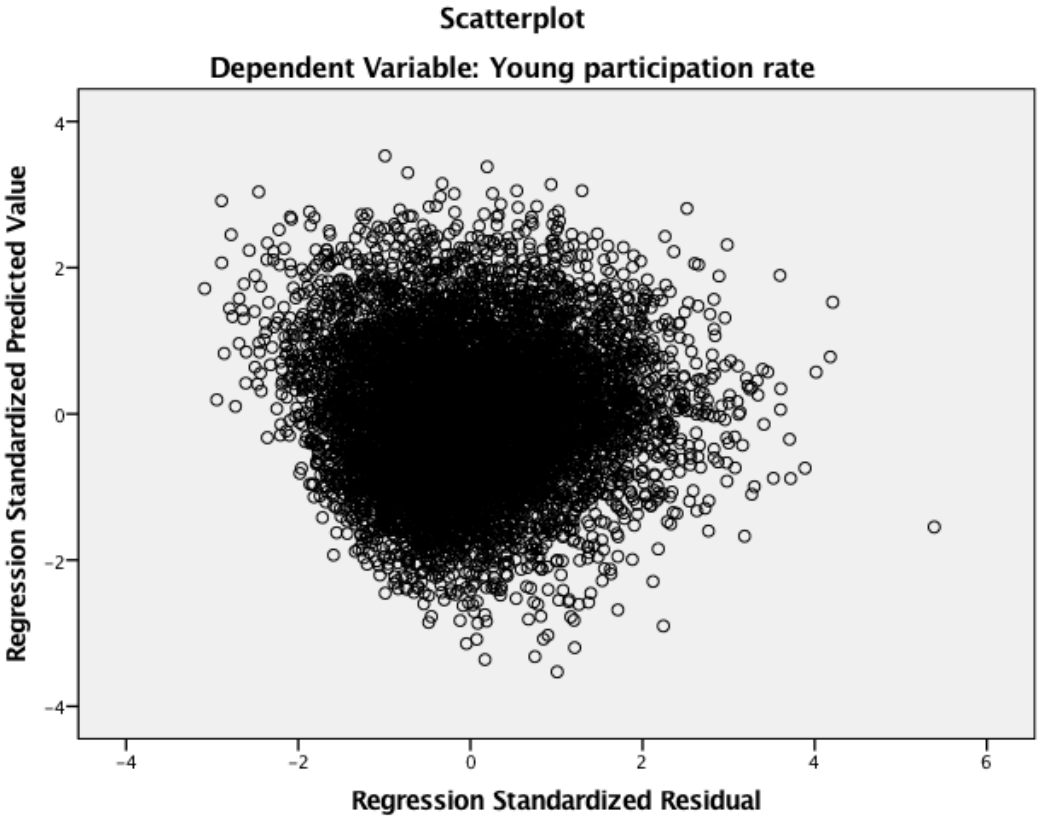


Figure 9: SPSS National Regression Analysis Scatterplot

Appendix M

Table 17: SPSS Regression Analysis Robustness Test Model Summary

Model Summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.551[a]	.304	.304	10.2686%	.304	3473.760	1	7958	.000
2	.566[b]	.321	.320	10.1450%	.017	196.035	1	7957	.000

a. Predictors: (Constant), Normal Score of IMD using Blom's Formula

b. Predictors: (Constant), Normal Score of IMD using Blom's Formula, Normal Score of DistancetoNearestHEI using Blom's Formula

c. Dependent Variable: Young participation rate

Appendix N

Table 18: SPSS Regression Analysis Robustness Test Coefficients Table

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	34.924	.115		303.442	.000
	Normal Score of IMD using Blom's Formula	-6.786	.115	-.551	-58.939	.000
2	(Constant)	34.924	.114		307.138	.000
	Normal Score of IMD using Blom's Formula	-6.901	.114	-.561	-60.510	.000
	Normal Score of DistancetoNearestHEI using Blom's Formula	-1.597	.114	-.130	-14.001	.000

a. Dependent Variable: Young participation rate

Appendix O

Table 19: SPSS London Regression Analysis of University Participation, Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.402[a]	.161	.160	9.6099%	.161	120.087	1	624	.000
2	.405[b]	.164	.161	9.6023%	.003	1.984	1	623	.159

a. Predictors: (Constant), IMD (Normal Score)

b. Predictors: (Constant), IMD (Normal Score), Mean Distance to HEI (Normal Score)

Appendix P

Table 20: SPSS East of England Regression Analysis of University Participation, Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.402[a]	.161	.160	9.6099%	.161	120.087	1	624	.000
2	.405[b]	.164	.161	9.6023%	.003	1.984	1	623	.159

a. Predictors: (Constant), IMD (Normal Score)

b. Predictors: (Constant), IMD (Normal Score), Mean Distance to HEI (Normal Score)

Appendix Q

Table 21: SPSS South West Regression Analysis of University Participation, Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.615[a]	.378	.378	9.3048%	.378	769.417	1	1266	.000
2	.640[b]	.409	.408	9.0737%	.031	66.311	1	1265	.000

a. Predictors: (Constant), IMD (Normal Score)

b. Predictors: (Constant), IMD (Normal Score), Mean HEI Distance (Normal Score)

Appendix R

Table 22: National Mean Distance to Nearest 3 HEIs Descriptives

Descriptive Statistics

	N	Range	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Mean Distance (Nearest 3)	7960	231.679072	30.7882082	.267880359	23.8999728	571.209	2.198	.027	7.579	.055
Valid N (listwise)	7960									

Appendix S

Table 23: East of England Mean Distance to Nearest 3 HEIs Descriptives

Descriptive Statistics

	N	Range	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Mean Distance (Nearest 3)	1268	79.6045934	39.4162789	.513226302	18.2754690	333.993	.662	.069	-.328	.137
Valid N (listwise)	1268									

Appendix T

Table 24: South West Mean Distance to Nearest 3 HEIs Descriptives

Descriptive Statistics

	N	Range	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Mean Distance (Nearest 3)	1090	225.800425	55.3641558	1.15420666	38.1063038	1452.090	1.260	.074	1.647	.148
Valid N (listwise)	1090									

Appendix U

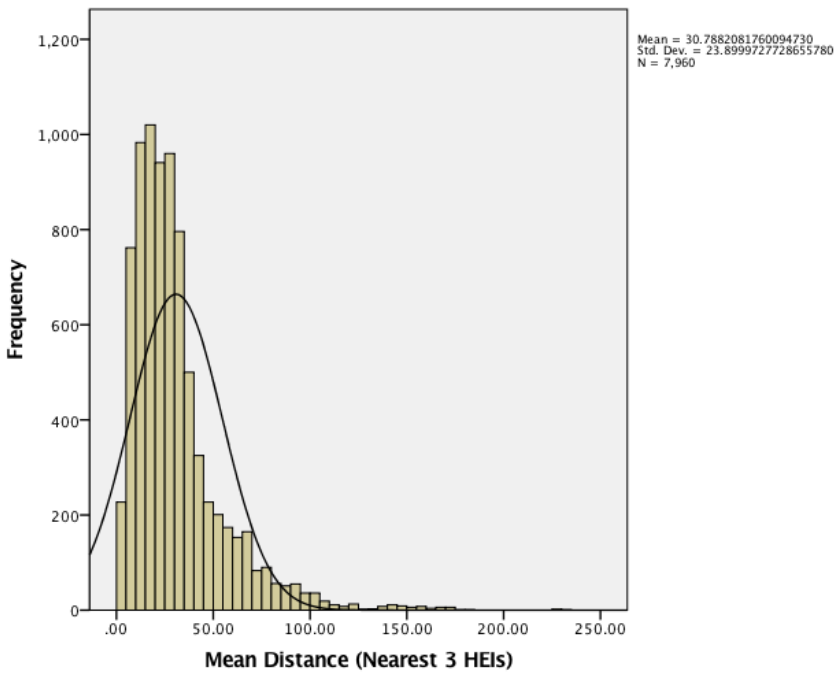


Figure 10: National Mean Distance to Nearest 3 HEIs Histogram

Appendix V

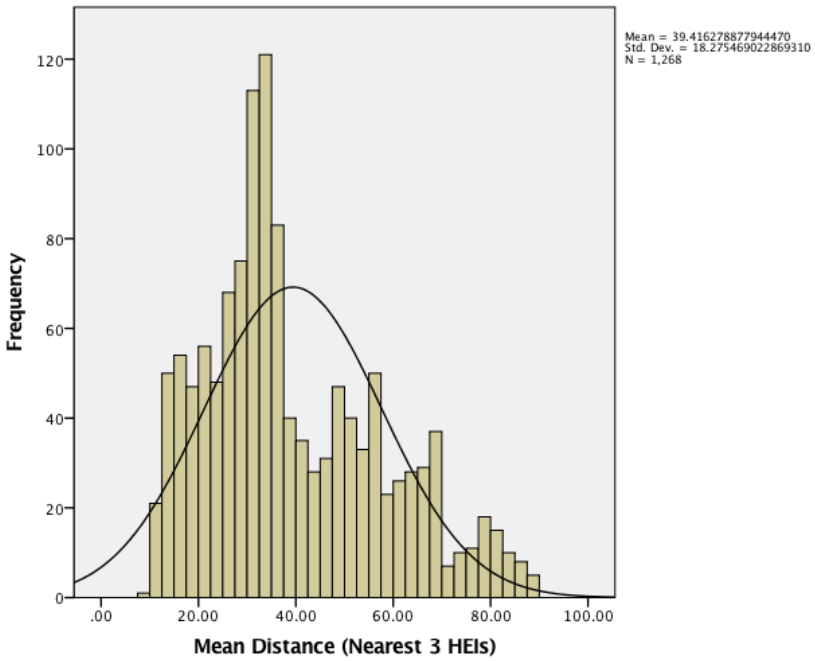


Figure 11: East of England Mean Distance to Nearest 3 HEIs Histogram

Appendix W

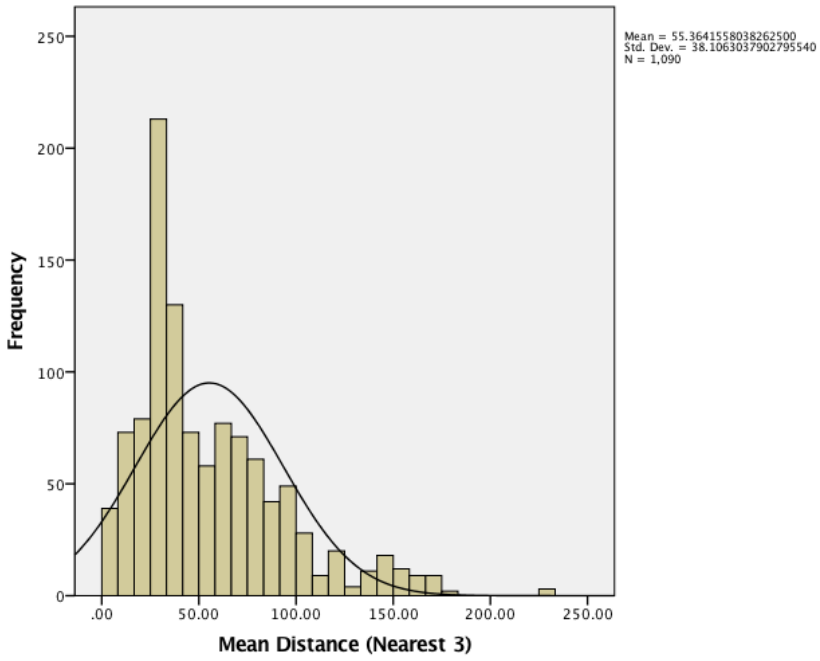


Figure 12: South West Mean Distance to Nearest 3 HEIs Histogram

Appendix X: Example Consent Form

UNIVERSITY OF OXFORD
DEPARTMENT OF EDUCATION

15 Norham Gardens, Oxford OX2 6PY
Tel: +44(0)1865 274024 Fax: +44(0)1865 274027
general.enquiries@education.ox.ac.uk www.education.ox.ac.uk

Director Professor John Furlong

Research Consent Form

Project Title:
Researcher:

Declaration of Consent: I have read the participant information sheet and have had the opportunity to ask questions about the study and receive satisfactory answers to questions.

I understand that I may withdraw from the study without penalty at any time by advising the researchers, and any data already recorded will be discarded

I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford's Central University Research Ethics Committee

I understand that my personal data will be treated in total confidence, kept securely in a password-controlled server; and what will happen to the data at the end of the project

I understand that I will have the opportunity to review and comment on any analysis before publication.

I understand how to raise a concern and make a complaint, and agree to participate in this study

☐ I agree to voluntarily take part in this interview.

☐ I confirm that I have read the associated information sheet and understand the intent and purpose of this research.

☐ I agree that data captured by this research can be shared among the research team on this project.

Name of Participant: _____ Email:_____

Signature: _____ Date: _____

Name of Researcher_____ Signature and Date: _____

Appendix Y: CUREC Approval Confirmation

Reply Reply All Forward

CUREC application: Access to higher education, geographical inequalities and deprivation

[redacted]@education.ox.ac.uk]

To: [redacted]@education.ox.ac.uk[redacted] Education Research Office

Attachments: (4) Download all attachments
[redacted]_CUREC_1A-.pdf (4 MB) [Open as Web Page]; [redacted] Interview que~1.docx (128 KB) [Open as Web Page]; [redacted] Invitation Le~1.docx (15 KB) [Open as Web Page]; [redacted] Participant I~1.docx (78 KB) [Open as Web Page]

10 March 2016 5:28 PM

- You replied on 11/03/2016 10:47 AM.

Application Approval

Title: *Access to higher education, geographical inequalities and deprivation*

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants. Thank you for submitting such a clear application! I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted to you.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse:
http://www.nspcc.org.uk/Inform/research/briefings/reporting_child_abuse_wda74908.html

Please note that CUREC approval does not guarantee access to participants, and it is your responsibility to check whether countries or contexts in which you plan to conduct your research might impose additional requirements (such as DBS checks).

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details to research.office@education.ox.ac.uk for consideration.

Good luck with the project!

[redacted]

[redacted]

Research Fellow

Bibliography

Anders, J. (2012). The Link between Household Income, University Applications and University Attendance. *Journal of Applied Public Economics*, *33*(2), 185–210.

Arnett, G. (2014). London gets 24 times as much spent on infrastructure per resident than north-east England. Retrieved June 8, 2016, from http://www.theguardian.com/news/datablog/2014/aug/07/london-gets-24-times-as-much-infrastructure-north-east-england

Baars, S., Bernardes, E., Elwick, A., Malortie, A., McAleavy, T., McInerney, L., … Riggall, A. (2014). *Lessons from London schools: investigating the success*. London, England.

BERA. (2011). Ethical Guidelines for Educational. *British Educational Research Association*, 5. http://doi.org/978-0-946671-32-8

Boliver, V. (2013). How fair is access to more prestigious UK universities? *British Journal of Sociology*, *64*(2), 344–364. http://doi.org/10.1111/1468-4446.12021

Brooks, R. (2002). "Edinburgh, Exeter, East London - or employment?" A review of research on young people's higher education choices. *Educational Research*, *44*(2), 217–227. http://doi.org/10.1080/00131880110107405

Brooks, R. (2003). Discussing higher education choices: differences and difficulties. *Research Papers in Education*, *18*(3), 237–258. http://doi.org/10.1080/0267152032000107310

Cantle, T. (2001). *Community Cohesion: A Report of the Independent Review Team*. London, England.

Chandler, R., Anstey, E., & Ross, H. (2015). Listening to Voices and Visualizing Data in Qualitative Research: Hypermodal Dissemination Possibilities. *SAGE Open*, *5*(2). http://doi.org/10.1177/2158244015592166

Chitty, C. (2014). *Education policy in Britain* (Third). Basingstoke: Palgrave Macmillan.

Chowdry, H., Crawford, C., Dearden, L., Goodman, A., & Vignoles, A. (2010). Widening participation in higher education: analysis using linked administrative data. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, *IFS Workin*, 1–30. http://doi.org/10.1111/j.1467-985X.2012.01043.x

Christie, H. (2005). Higher education and spatial (im)mobility: Nontraditional students and living at home. *Environment and Planning A*, *39*(im), 2445–2463. http://doi.org/10.1068/a38361

Cohen, L., Manion, L., & Morrison, K. (2013). *Research methods in education* (7th ed.). Hoboken, NJ: Taylor and Francis.

Corke, S., & Wood, J. (ONS). (2009). *Portrait of the East of England*. *Regional Trends* (Vol. 41). London, England.

DCLG. (2011). *The English Indices of Deprivation 2010*. *Neighbourhoods Statistical Release*. London.

Denzler, S., & Wolter, S. C. (2010). Der Einfluss des lokalen Hochschulangebots auf die Studienwahl. *Zeitschrift Für Erziehungswissenschaft*, *13*(4), 683–706. http://doi.org/10.1007/s11618-010-0143-6

Department for Education. (2004). *Fair admissions to higher education: recommendations for good practice*. *Admissions to Higher Education Steering Group*. London, England.

Dunnett, A., Moorhouse, J., Walsh, C., & Barry, C. (2012). Choosing a University: A conjoint analysis of the impact of higher fees on students applying for university in 2012. *Tertiary Education and Management*, *18*(3), 199–220. http://doi.org/10.1080/13583883.2012.657228

Else, H. (2014, March). Universities build golden dreams at Olympic Park. *Times Higher Education*.

Frenette, M. (2004). Access to College and to University : Does Distance to School Matter. *Canadian Public Policy*, *30*(4), 427–443.

Frenette, M. (2006). Too Far to Go On? Distance to School and University Participation. *Education Economics*, *14*(1), 31–58. http://doi.org/10.1080/09645290500481865

Gibbons, S., & Vignoles, A. (2011). Geography, choice and participation in higher education in England. *Regional Science and Urban Economics*, *42*(1-2), 98–113. http://doi.org/10.1016/j.regsciurbeco.2011.07.004

Gibney, E. (2013). Concentration of UK universities v population distribution. Retrieved May 31, 2016, from https://www.timeshighereducation.com/news/concentration-of-uk-universities-v-population-distribution/2006284.article

Grid Reference Finder. (2016). Grid Reference Finder. Retrieved May 5, 2016, from http://www.gridreferencefinder.com

Hammersley, M. (2008). Paradigm war revived? On the diagnosis of resistance to randomized controlled trials and systematic review in education. *International Journal of Research & Method in Education*, *31*(1), 37–41. http://doi.org/10.1080/17437270801919826

HEFCE. (2016a). *National collaborative outreach programme*. Bristol.

HEFCE. (2016b). Register of HE Providers. Retrieved May 5, 2016, from http://www.hefce.ac.uk/reg/register/search/Home/ByPropertyhttp://www.hefce.ac

.uk/reg/register/search/Home/ByProperty

HEFCW. (2014). *Participation rates for Welsh domiciled students in higher education within the UK during 2012/13*. Cardiff.

Higher Education Founding Council for England. (2012). *Technical note: Gaps in young participation in higher education*.

Hutchings, M., & Archer, L. (2016). Research Papers in Education " Higher than Einstein ": constructions of going to university among working-class non-participants " Higher than Einstein ": constructions of going to university among working-class non-participants. *Research Papers in Education*, *1522*(March). http://doi.org/10.1080/02671520010011879

Isaac, A. (2016, February). Unrelenting pressure and 12 hour days: headteacher recruitment is in crisis too. *The Guardian*. London, England.

James, D. (2001). "Teaching Girls": Intermediate Schools and Career Opportunities for Girls in the East Glamorgan Valleys of Wales, 1896-1914. *History of Education*, *30*(6), 513–526.

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed Methods Research: A Research Paradigm Whose Time Has Come. *Educational Researcher*, *33*(14), 14–26. http://doi.org/10.3102/0013189X033007014

Jones, E. (1994). *Neil Kinnock*. Ramsbury, Wiltshire: Robert Hale Limited.

Jump, P. (2015, March). Coventry heats up Scarborough with higher education. *Times Higher Education*.

Leapman, M. (1987). *Kinnock*. London: Unwin Hyman.

Leech, N. L., & Onwuegbuzie, A. J. (2007). A typology of mixed methods research designs. *Quality and Quantity*, *43*(2), 265–275. http://doi.org/10.1007/s11135-007-9105-3

Manchester Metropolitan University. (2015). *Manchester Metropolitan University Undergraduate Prospectus 2016*. Manchester.

Mangan, J., Hughes, A., Davies, P., & Slack, K. (2010). Fair access, achievement and geography: explaining the association between social class and students' choice of university. *Studies in Higher Education*, *35*(3), 335–350. http://doi.org/10.1080/03075070903131610

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis* (3rd ed.). Thousand Oaks, CA: Sage.

Morgan, J. (2016, July). Fee cap of £9,250 confirmed for 2017-18. *Times Higher Education*. London, England.

Morrison, A. (2011). Questions of degree? Middle-class rejection of higher education

and intra-class differences in educational decision-making. *Journal of Further and Higher Education*, *35*(1), 37–54. http://doi.org/10.1080/0309877X.2010.540232

Norwood, G. (2014). South Cornwall's real estate market enjoys sea change in fortunesle. *The Financial Times*. London, England.

OECD. (2015a). *Education at a Glance 2015*. Paris.

OECD. (2015b). *In It Together: Why Less Inequality Benefits All. OECD Publishing* (Vol. 84). http://doi.org/10.1787/9789264235120-en

Office for National Statistics. (2006). UK Standard Area Measurements. Retrieved July 19, 2016, from http://webarchive.nationalarchives.gov.uk/20160105160709/https://geoportal.statistics.gov.uk/geoportal/catalog/main/home.page#BD

Onwuegbuzie, A. J., & Leech, N. L. (2005). Taking the "q" out of research: Teaching research methodology courses without the divide between quantitative and qualitative paradigms. *Quality and Quantity*, *39*(3), 267–296. http://doi.org/10.1007/s11135-004-1670-0

Pallant, J. (2007). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed.). Maidenhead: Allen & Unwin.

Parker, P. D., Jerrim, J., Anders, J., & Astell-Burt, T. (2015). Does Living Closer to a University Increase Educational Attainment? A Longitudinal Study of Aspirations, University Entry, and Elite University Enrolment of Australian Youth. *Journal of Youth and Adolescence*. http://doi.org/10.1007/s10964-015-0386-x

Robson, C. (2005). *Real world research: A resource for social scientists and practitioner-researchers* (2nd ed.). Oxford, England: Blackwell.

Sá, C., Florax, R., & Rietveld, P. (2006). Does Accessibility to Higher Education Matter? Choice Behaviour of High School Graduates in the Netherlands. *Spatial Economic Analysis*, *1*(2), 155–174. http://doi.org/10.1080/17421770601009791

Singleton, A. D. (2010). *International Population Studies : Educational Opportunity : The Geography of Access to Higher Education*. Farnham, England: Ashgate Publishing, Ltd.

Smith, E. (ONS). (2010). *Portrait of the South West*. *Regional Trends*. London, England.

Spiess, C. K., & Wrohlich, K. (2010). Does distance determine who attends a university in Germany? *Economics of Education Review*, *29*(3), 470–479. http://doi.org/10.1016/j.econedurev.2009.10.009

Stokes, P. (2013). 2011 Census : Characteristics of Built-Up Areas, 1–32.

Sullivan, A., Parsons, S., Wiggins, R., Heath, A., & Green, F. (2014). Social origins, school type and higher education destinations. *Oxford Review of Education*, *40*(March 2015), 739–763. http://doi.org/10.1080/03054985.2014.979015

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, Mass.: Pearson.

The Economist. (2016, July). Brexitland versus Londonia. *The Economist*.

Thomas, G. (2013). *How to Do Your Research Project : A Guide for Students in Education and Applied Social Sciences* (Second Edi). Los Angeles: SAGE.

UCAS. (2015). End of Cycle Report 2015. *Ucas*, (1), 1–5. http://doi.org/10.1007/s13398-014-0173-7.2

UCAS. (2016a). Entry rate data explorer for parliamentary constituencies. Retrieved July 7, 2016, from https://www.ucas.com/corporate/data-and-analysis/ucas-undergraduate-releases/he-entry-rates

UCAS. (2016b). *UK application rates by the January deadline 2016 cycle UCAS Analysis and Research*. Cheltenham.

Weale, S. (2016, August). Abolition of student maintenance grant “will hurt those most in need.” *The Guardian*, p. 1. London, England.

Yorke, M., & Longden, B. (2004). *Retention and student success in higher education*. (B. Longden, Ed.). Maidenhead: Maidenhead : Society for Research into Higher Education & Open University Press.